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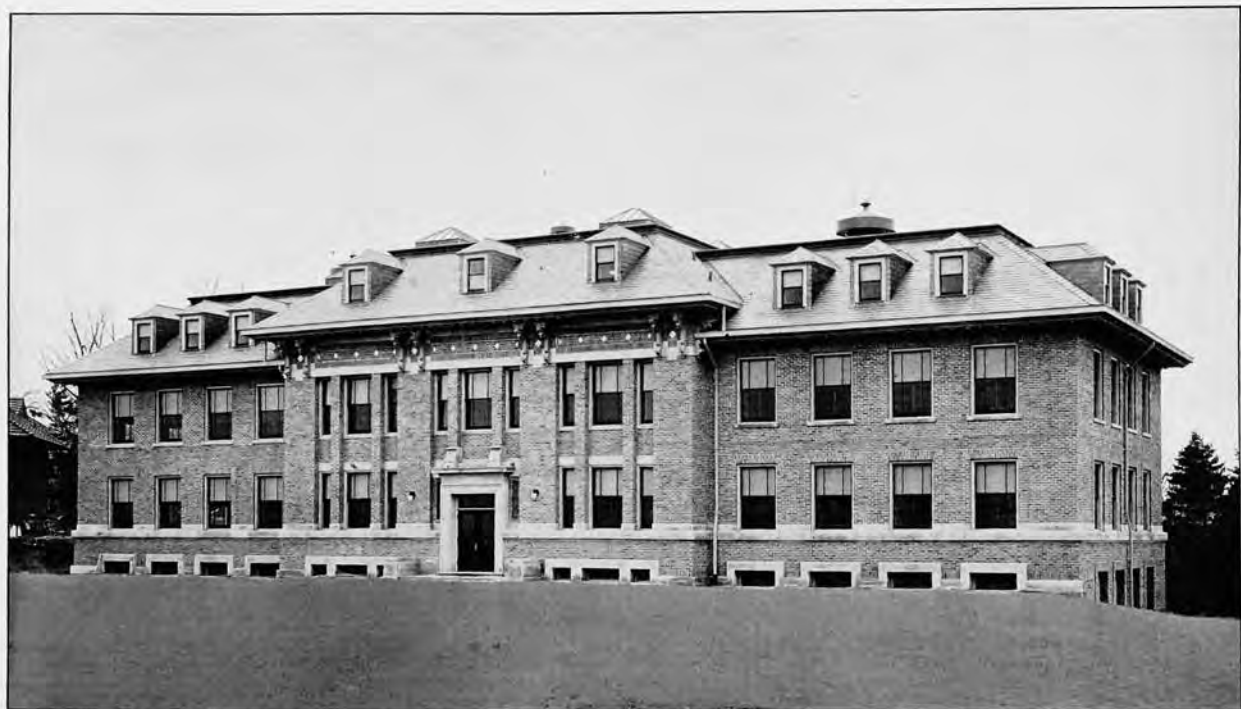
PROCEEDINGS AT THE
OPENING OF THE FORESTRY BUILDING
MAY 15, 1914

OPEN MEETING OF
THE SOCIETY OF AMERICAN FORESTERS
MAY 16, 1914

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FORESTRY BUILDING

PART I

PROCEEDINGS AT THE
OPENING OF THE FORESTRY BUILDING
NEW YORK STATE COLLEGE OF AGRICULTURE
AT CORNELL UNIVERSITY

MAY 15, 1914

PROGRAM

OPENING OF THE FORESTRY BUILDING

FRIDAY, MAY 15, 1914

MORNING SESSION

Chairman—W. A. STOCKING, Jr., Acting Director, New York State College of Agriculture.

National Forestry—

W. B. GREELEY, Washington, D. C.; Assistant Forester, United States Forest Service.

Forestry on the Farm—

W. H. VARY, Watertown, New York; Master, New York State Grange.

Forestry as an Investment—

CHARLES M. DOW, Jamestown, New York; Director, Letchworth Park and Arboretum.

The Work of the New York State Conservation Commission—

C. R. PETTIS, Albany, New York; Superintendent of Forests, New York State Conservation Commission.

AFTERNOON SESSION

Chairman—W. H. VARY, Master, New York State Grange.

Principal Lines of Effort in American Forestry for the Next Decade

In Training Foresters—

JAMES W. TOUMEY, New Haven, Connecticut; Director, Yale Forest School.

In Lumbering—

F. L. MOORE, Watertown, New York; President, Empire State Forest Products Association.

In Making Public Opinion Effective—

H. S. DRINKER, South Bethlehem, Pennsylvania; President, American Forestry Association; President, Lehigh University.

In New York State—

J. S. WHIPPLE, Salamanca, New York; President, New York State Forestry Association.

EVENING SESSION

Chairman—T. F. CRANE, Former Dean, College of Arts and Sciences, Cornell University.

The Forest—

L. H. BAILEY, Ithaca, New York; Former Director, New York State College of Agriculture.

The National Movement for Conservation—

GIFFORD PINCHOT, Milford, Pennsylvania; President, National Conservation Association.

NATIONAL FORESTRY

BY W. B. GREELEY, WASHINGTON, D. C.

Assistant Forester, United States Forest Service

In the nature of things a forester must be a man of vision. His effectiveness is measured largely by his faith in the scientific and economic order for which he stands and toward the accomplishment of which his energies are bent, a faith comparable in certainty to the natural processes which he studies and through which he works.

The men who established the Cornell School of Forestry sixteen years ago were men of vision. They proposed to train men for a profession that did not exist in the United States, and for the accomplishment of a public task that was but dimly grasped by a small number of persons. Difficulties have not been lacking to test the faith that led to the establishment of this institution. The occasion that brings us here to-day in recognition of a significant step in its development and usefulness goes far to justify that faith, and, viewed as part of the nation-wide development in forestry since 1898, to make the vision of the earlier years a thing of reality. And it is significant of the spirit which has established and developed forestry instruction at Cornell, that the keynote at this meeting should be the work which lies ahead of us.

In outlining the principal efforts in national forestry that mark the forward road for another ten years, the term cannot be used in any narrow technical sense. Present-day problems call for special emphasis on its economic phases. National forestry is the business of keeping the country supplied with wood, of utilizing its timber with thrift, and of conserving other resources, particularly water, the permanence of which is interlocked with that of the forests.

First among the problems confronting the federal Forest Service stands the business administration and usefulness of the national forests. It is no slight task to transform one hundred and sixty-five millions of acres of virgin wilderness in the most rugged and inaccessible sections of a new country into developed forest properties, yielding a cut of timber equivalent to current production, not only self-supporting but paying revenues commensurate with their physical value, and with all their latent resources made useful to the public. This is a task for much more than ten years, but ten years should witness a tremendous advance toward its accomplishment. The problem is primarily one of business-like administration of a two-million-dollar property. By concentrating on the scientific development and administration of its own forests, the Federal Government not only will be putting forth its best efforts to solve the general economic problem of national timber supply, but also may, by practical demonstration, point out the road that the private owner will take when the conditions in his business warrant it.

Ten years will witness notable changes in the development of the national forests. This period should see the fundamental problem of fire protection largely reduced, by a perfected organization of men and equipment, to terms of everyday insurance. It should see the cut of timber brought up from a small fraction of the possible yield of these areas to an amount approximating the current production

of the forests; from less than one per cent of the annual cut of forest products in the United States to a fraction which, while still minor, will be an important factor in the timber supply of the country, and an invaluable instrument for the maintenance of healthy competition in the lumber trade. Another decade should witness a large increase both in the physical value of the public forests and in their productivity. This will be accomplished by the reforestation of many denuded areas, in part by the natural extension of tree growth under protection from fire and in part by planting areas that cannot be restored to their original forest without assistance.

While our work on the national forests is concerned primarily with practical features of administration, much is still to be done in the investigation of technical problems involved in efficient management. The problems of closer and more profitable utilization of raw forest products, and those of artificial reforestation, are perhaps of the greatest immediate urgency. Other questions of practical silviculture and forest management, while of less immediate importance, are coming to the front.

It would obviously be foolish to attempt refinement of scientific method in the present handling of these vast undeveloped virgin areas, with their enormous surplus of over-mature timber. Year by year our maps and estimates are pushed out over the regions where such data are most critically needed, but at a snail's pace in comparison with the enormous area that must ultimately be covered. Working plans will be attempted in the course of the next few years on but a very few national forests, where the demand of local industries is making rapid inroads on the timber and there is danger of early depletion. In such cases, rough plans for regulating the cut will be worked out with a view to gradually restricting it to the current production of the forest. Elsewhere, with enormous areas of mature virgin stands in need of cutting, the immediate thing is to work out and apply simple methods of silviculture which are practicable under existing methods of logging and which will accomplish the fundamental requirements of utilizing mature stumpage and leaving the stand in improved condition. The great bulk of our pine forests lend themselves readily to partial cutting, conforming with the natural grouping of the timber by age and size, under which we retain a quarter or a third of the merchantable timber with usually a fair stocking of young growth, sufficient to afford a second cut in thirty to fifty years. In the heavy, even-aged stands of Douglas fir and western white pine in the Northwest, we have found the most practicable plan to be clean cutting with the reservation of a small percentage of the stand for reseeding, to be supplemented in some cases by artificial planting. These simple provisions, with the cleaning-out of insects and disease as far as practicable and the burning of slashings, represent about all that should be attempted for the present in the way of technical forestry.

In the meantime, however, a chain of experiment stations has been established covering all the more important forest regions in the West, at which intensive studies of silvicultural methods on small areas are being conducted, together with observations on the influences of the forest on water storage and meteorological conditions. Another important function of the experiment stations is in developing the technique of reforestation. This chain of stations furnishes the Service with a series of miniature forests, on which the problems of technical administration as they arise can be solved on a laboratory scale, and methods developed that

can be applied with certainty on the big forest areas surrounding them. At our experiment stations, manned with a corps of trained investigators, we are thus seeking to develop the science of Western American silviculture and meet the technical requirements of administration as they develop.

From a practical standpoint, probably our greatest present concern on the investigative side is the effective utilization of the three or four billion feet of wood which by the end of the next decade will be cut annually from the national forests; and restoring to usefulness the five or six million acres of burned-off timberlands whose idleness represents an annual loss of at least half a million dollars. On these two problems our efforts in technical investigation will be largely concentrated.

The almost limitless possibilities of more effective utilization of the grown tree, particularly of the parts now wasted, lies very close to the interests of the Forest Service. Not only does it concern directly the proceeds obtained from the federal timberlands under our management, but also it is the fundamental economic basis for substantial progress toward the general realization of forestry. I cannot hold out much encouragement to the owner of forest land to manage his property for future returns on the ground of any great enhancement in the near future in the market value of the staple products now manufactured from wood. I do believe, however, that he may anticipate substantial increases in the returns from his timber by utilizing much more of it than he does now, and parts of it for more valuable products than he does now. And I am convinced that progress toward the fundamental economic basis of forestry, which must be gradually approached as the supply of mature-grown timber is exhausted—that the value of a grown tree must equal the cost of growing it—will depend during the next ten years largely on better ways of utilizing the raw products of the forest. The value of a long-leaf pine tree when cut into the grades of lumber commonly salable may be trebled if its turpentine and resin are extracted, its top and limb wood manufactured into kraft paper, and the parts of the trunk that would make but low-grade lumber put into paper or fiber-board. This sort of thing, to my thinking, will largely measure the progress in forestry within the period immediately confronting us. That is why better utilization—through pulp and paper manufacture, the manufacture of ethyl alcohol from wood (which chemists tell us is the future industrial fuel of the United States), and the production of other distillates and by-products—is one of the foremost lines of investigation conducted by the Forest Service.

Reforestation on the national forests in the past has consisted chiefly of experiments applicable to an enormous range of climate and soil conditions. Many serious difficulties and failures have been encountered in this preliminary work of developing a new science under untried conditions, often of an extremely adverse character.

It has required a deal of bulldog tenacity and of steadfast refusal to admit defeat to carry this work through to the point that has now practically been reached, of understanding the possibilities and limitations of this work in each locality. The reforestation work of the Service at Halsey, Nebraska, is, I hope and believe, indicative of this effort, of such direct and practical bearing on American forestry, in all the national forest regions. After many failures and partial successes in the western Nebraska sand hills, methods have finally been developed

under which plantations are successful practically every year and by which we are now extending the work in that region at the rate of eight hundred or one thousand acres annually. Forest conditions have actually been established on a small patch of sand hills, with a canopy overhead, humus underfoot, and small quantities of seed have been borne which is being used in our nurseries.

On the national forests as a whole, the reforestation work has reached the point where it can now be extended on a much larger scale with reasonable certainty of the results. We have developed an equipment of seventeen good-sized nurseries and twenty-one small nurseries, having an annual capacity all told of around twenty million seedlings. With this nursery stock and with a limited amount of direct seeding in a few localities such as the Black Hills, where this method has proved successful, the next ten years should witness very definite progress in reforesting our denuded lands at the rate of not less than twenty thousand acres annually, increasing to that extent the permanent resources and value of the national forests.

The increasing cut of national forest timber will make it more and more of a factor in supplying the national lumber pile. The chief significance of this fact is its bearing on the general economic situation as regards lumber supply and lumber prices. We have on these public lands six hundred billion feet of timber, probably a fifth of the country's supply, which the people own and which is to be used as the people direct. It might be thrown on the market rapidly at very low prices in an effort to reduce the cost of lumber to consumers.

As far as such a policy succeeded, it would throw the lumber trade into a brief period of broken prices, liquidation of the weaker operators, and the most wasteful kind of exploitation. The margin of return on low-grade logs is always slight. In periods of over-production and low prices, more and more of them will not repay the cost of manufacture and must be left in the woods. Not infrequently depressed market conditions have resulted in the waste of forty to fifty per cent of the material which under normal conditions is utilized.

In so far as extreme competitive selling of government timber would be able to force down lumber prices, therefore, it would throw the industry into a frenzied period of wasteful exploitation from which the country would emerge a few years hence with its public reserve gone, a large part of its private supply wasted, and the remainder in the hands of a few of the strongest survivors, exceedingly well placed to hold it at monopoly prices.

As a matter of fact, even the temporary boon of lower prices would not be secured by the public. As long as the great bulk of the timber supply is in private hands and the industry is conducted on such a highly competitive footing as at the present time, no amount of government timber that it would be possible to throw on the market could affect prices materially. They are too well fixed by broad lines of competition from many producing regions; and the only result of sacrifice sales of public timber would be to increase disproportionately the returns of the fortunate operators who handled it.

On the other hand, the selling of national forest timber might be closely restricted, making these areas simply big reservoirs of wood held in cold storage until private supplies are exhausted. By keeping government timber off the market, this policy would, sooner or later as competitive conditions in the industry become less marked, enable the private operator both to utilize his timber

more completely and to get higher prices for it. As far as there may be any tendency toward monopolistic control of the lumber industry or the extraction of monopolistic prices for its product, such a policy in the handling of government lands would strengthen and support it. Closer utilization of forest-grown material in the course of time would undoubtedly be fostered, but at a corresponding, and not unlikely an unwarranted, increase in the prices paid by the consumer through the withdrawal of public competition.

Advocates in plenty have urged on the Federal Government the adoption of each of these divergent policies. We conceive it to be our duty, however, to do neither. We conceive it to be the first and foremost function of the timber retained in public ownership to maintain competitive conditions in the lumber industry whenever there shall be any tendency toward closely controlled production; and to prevent as far as is possible, through the sale of public stumpage, monopolistic increases in the price of forest products or increases unwarranted by rational adjustments of the trade to changed conditions of supply and demand. That is, as far as the public reserves can influence the market, it is their business to give the country the lumber it requires, at the lowest price justified by the supply available for present and future needs. The availability of large areas of public timber for purchase by any independent operator, who can thus at any time without timber holdings of his own enter the trade and compete with its vested interests, is the most effective check on monopoly that a country could possibly hold. Ultimately, when the lumber industry passes through its present highly competitive stage and the concentration of standing timber in a few hands which is now taking place tends toward monopoly in lumber production, the national forests will in just this way serve the interests of every consumer in the United States.

At the same time we conceive it our duty to promote effective utilization of timber and to prevent serious waste of a resource the supply of which is all too limited. In other words, there is a definite point in competitive conditions below which the Government will not go in disposing of the public timber. That point is determined solely by consideration of the public welfare, but requires stable conditions in a manufacturing industry, rightly adjusted to its available supply of raw material—conditions that make for permanent operation on a reasonable margin of profit, rather than for frenzied speculation on the one hand or demoralization and financial crashes on the other. And it requires also close utilization of the raw materials produced in the woods. As time goes on, the public forests ought in these ways to be the governor on the engine, safeguarding the permanent interests of both the lumber manufacturer and the lumber consumer without running to temporary extremes in favor of either.

All this is probably looking farther ahead even than the next ten years. It is, however, desirable to know whither we are heading, and to carry with us a reasonably clear understanding of the fundamental economic bearing and purposes of the work on which we are engaged.

In the meantime our chief concern is to develop the sales of national forest timber, not only by methods of sound silviculture, however simple they may be, but also by methods of sound business and sound public policy in relation to the local and general benefits that the national forests should serve.

We are making, all told, some six thousand timber sales a year. The great bulk of these consist of small quantities of stumpage required by local residents and communities, and by mining and other industries near the forests. The supply of local needs is the first consideration in handling timber sales. If the supply is limited and local use extensive, national forest stumpage is reserved altogether for the needs of the immediate region. It is becoming a larger factor every day in supplying the mines, the railroads, the irrigation districts, and the communities of the Western States.

Where there is a surplus of stumpage over local demand, as in the great public forests of the Northern Pacific Coast and the Idaho Panhandle, sales for the general market are encouraged. The small operator is always preferred when he is able and equipped to log and market national forest timber; and several small operators are always preferred to a single large plant wherever they are able to swing the business. A very large part of the national forest stumpage, however, is extremely inaccessible, and cannot be exploited without extensive investments for transportation facilities. Here there is a distinct call for the large, well-organized, and strongly financed lumber company. Our sales policy makes distinct provision for large contracts and long cutting periods under conditions such as these. The amount of timber contracted is sufficient to justify the investment in railroads, new mills, and logging equipment, and the length of time sufficient to permit the removal of such stumpage at a practicable rate of operation.

There is thus a distinct place for big business in our scheme of things. We have not hesitated, in pursuance of this policy, to contract as much as eight hundred million or a billion feet in a single sale, with a cutting period of twenty or twenty-five years. All these sales mean the development of an inaccessible patch of western wilderness, which, without an enterprise of this character and of this size, might as well be in the eternal snows of the Himalayas as far as any immediate practical benefits to the people of the United States are concerned. Every such sale brings into the forest its thirty, or fifty, or seventy-five miles of new railroad, always opening up more territory besides that covered in the purchase, and creating additional opportunities for lumbering operations in government timber.

Such a policy, of course, requires many safeguards. A painstaking, exhaustive appraisal of the value of the timber, and provision for a readjustment of the price paid the Government throughout the life of the sale, in accordance with the current value of the manufactured product, are the first essentials. Railroads constructed in pursuance of such contracts must be available to the purchasers of other tributary timber at reasonable rates, in order to prevent the locking-up instead of the opening-up of inaccessible forest regions by this policy. Sales must be made with the utmost publicity and after the widest possible advertisement to promote investigation and competitive bidding for the stumpage. Time limits must be specified, and the current manufacture of specified amounts of timber required, in order to prevent speculative holding. And sales must not be made to buyers who, by the control of government timber in conjunction with other timber, would acquire a monopoly of local lumber production.

Ten years will witness the development and crystallizing of this policy. Many features of it must still be worked out to a more exact and effective final basis than has yet been possible. It affords, however, in my judgment, a most significant

and interesting development of national conservation, in showing how the Government and the business man—the Government and the big business man, if you please—can cooperate in the utilization of public resources; and that conservation is a policy of development, not of retardation.

In this connection, I cannot refrain from suggesting a second effort in national forestry, using the term in its broadest economic sense, which the next decade should witness. I do so with hesitancy, because the subject may readily carry one far afield in speculation, and because, the more fully the tremendous size of the problem is realized, the more reluctance is felt to prophesy a successful solution even in general terms. I believe, however, that sooner or later a constructive national plan must be developed in cooperation with the lumber industry, under which the interests of the public in the rate at which privately owned timber is cut, the methods of cutting, and the character and extent of its utilization, will be protected. Rather than being antagonistic to the interests of the lumbering industry, I believe that that industry needs such control of the disposition of the uncut timber in the principal forest regions of the United States, on its own account, even more than the remainder of the people do on their account. Such a scheme cannot be approached from the standpoint of a private monopoly of lumber production under government sanction, or from that of enforced public regulation of output, price, and manner of cutting. There must be a meeting ground, which, while unquestionably demanding some sacrifice on both sides, should rest on principles recognized by both as essential for their permanent welfare.

It is clear to me that certain tendencies in the lumbering industry, speaking primarily of the major producing regions of the South and the West, are operating neither for its own benefit nor for the benefit of the public. Vast quantities of stumpage are being held for which there will be no normal market demand for many years. Carrying charges on these investments are making them greater and greater every year. One may safely say that they double every ten years. Many investors, particularly those who secured government timber in the early days of riotous disposal of the public lands, have made enormous profits by selling their holdings at advances in price. For six or seven years, however, there has been, broadly speaking, little or no advance in the intrinsic value of Western stumpage. More and more capital is required in order to carry such investments. Demands for interest are insistent. Hence the necessity of reducing the investment by manufacture at the first opportunity, and of continued manufacture in the face of adverse markets in order to meet carrying charges. The outgrowth of these conditions is, first, an almost constant tendency toward over-production and, second, wasteful exploitation of limited timber resources, which in a more or less aggravated form is inherent and unavoidable as the industry is now capitalized and conducted. In order to keep the business going and to pay current interest charges, the operator is often forced to leave a third or a half of his timber in the woods, taking out only the high-grade logs, which he can manufacture and sell on an over-stocked market.

Nor can I refrain from suggesting that these conditions in the lumber industry at the present time indicate the un wisdom of the public's parting title with its timber resources. The holding of a resource the greater part of which cannot be utilized in the natural course of trade for tens or scores of years, is essentially not a private, but a public, function. It should not be turned over to the chances of

private speculation, with all that is involved either of excessive profits on the one hand or of liquidation and wasteful exploitation in advance of its time on the other. How much better might it have been if another fifth or two fifths of our timber supply had been kept by the public, to be drawn upon when there should be a legitimate demand for it and when it could be fully utilized and not half wasted—in other words, to furnish a larger and more effective governor for the whole economic machine!

Regardless of the prosperity of the country's fourth greatest industry, which may rightfully be a matter of public concern, this sort of dissipation of the country's timber supply with no compensating economic benefits is something that the public ought not to tolerate on its own account. And this is wholly with reference to thrift in the use of what the country now has, saying nothing about provision for a timber supply in the future.

Some form of constructive regulation of the exploitation of privately owned forests in the United States is needed. Obviously the first necessity is a stock-taking of what we have, and a thorough investigation and understanding of the existing conditions in forest-using industries, conducted by public agencies in which both the manufacturer and the consumer have absolute confidence. Such an investigation might be followed by measures for the control of exploitation along lines analogous to those applied under public ownership and approaching public ownership in their practical results as to the amount of timber cut, the methods of cutting, the character of utilization, and the care and disposition of cut-over lands. It is hardly practicable for the public to acquire any considerable part of the forested lands now privately owned; but I do believe it practicable for the public and the lumbermen to get together on a basis of control that recognizes in a fair way the common interests of both parties. Obviously the public will not consent to aid the lumbering industry through reduction in the taxes on timberlands or the payment of higher prices for forest products, unless it is satisfied that it will get its money's worth in definite and tangible economic benefits. Nor can the industry be asked to sacrifice its returns by reinvesting a part of the proceeds in the land cut over, unless it has assurance of ultimate business benefits. Stability in the supply of timber for the lumbermen to manufacture and the public to use, and in the rates and conditions under which it is marketed on the one hand and bought on the other, should be common ground for harmonizing these interests and developing a practicable scheme of regulation.

It is perhaps too much to prophesy that substantial progress in this direction will be made in the next ten years; but clearly this is one of the great questions of national forestry which sooner or later must be answered.

While working out means of public or semi-public control of forest resources, we must not lose sight of opportunities to assist private owners of timberland to apply on their own initiative such measures of conservative management as may be practicable under the conditions in each case. Among the efforts in national forestry during the next decade, more constructive work in this field than has been possible in the past should be given a prominent place.

The Forest Service has been compelled during the last few years, by sheer necessity, to throw the bulk of its energies and resources into its big administrative and technical problems in the West. This has been done with the greater readiness because the remarkable development of state forest activities and the establish-

ment of the profession of private forestry have placed the Eastern field in good hands and made it fitting that the limited resources of the Federal Government should be devoted mainly to its distinctive work on the national forests in the West. Our field of usefulness, however, is in no sense sectional. Aside from federal activities under the Weeks Law within the past three years, in the purchase of national forests on Eastern water sheds and the protection of additional areas from fire in cooperation with States, the problems of private forestry in the East have always been close to our interests and purposes.

We regard this as a field that should continue to be dealt with largely through state and private agencies; and one of the most significant and promising things about the conservation movement in America is that state forestry and the profession of private forestry have developed to such an effective point in many of the States as to cover this field of work effectively within a space of scarcely more than half a dozen years. Nevertheless, there are, I believe, certain ways in which the federal organization can help, without duplicating the efforts of local agencies but in support of their work. And such help as we can we propose to give.

Two major problems are presented in the practical adoption of forestry by private owners. The first is the problem of the larger timber holding, where forestry must stand on its own merits as an enterprise by itself. The second is the problem of the woodlot, where forestry is aided by relationship with agriculture as the principal industry.

Plans are now being perfected by the Forest Service for a survey of the conditions existing in the principal forested regions of the Eastern States in regard to the practicability of various phases of conservative management of timberlands. Under this term I include systematized fire protection and improved utilization of the timber cut, as well as measures designed to secure future forest crops. It will be the purpose of this survey to keep the Forest Service informed of what private owners and operators are attempting in any of these directions, what appears practicable for them to do under present conditions in their industry, and in what respects, if any, the Forest Service can assist in bringing about improvements in the current practice of handling timberlands. Any part of the organization of the Forest Service that can help on a specific and practical problem—be it fire protection, better utilization of the raw product, or an investigation of the possibilities of second growth—will be brought to bear on any situation where it seems that we are in a better position than any other available agency to help. Special emphasis will be given to closer and more profitable utilization, because of its tremendous importance in making more conservative cutting of timberlands economically possible.

It will be readily understood that this work is not being undertaken in the pursuit of any chimera that it is going to bring about the practice of forestry on private lands, or that even in many individual cases complete technical schemes can be laid down which will change over the management of a property from the old basis to the new. We realize fully that the process will rather be one of gradual adjustment, of slight improvements here and there; and that in many cases our survey will plot large areas under the caption "Nothing now practicable." It will also be understood that one of the results of this reconnaissance of which we are most hopeful, is that through it we may be the means of strengthening the forestry work of the States, of establishing forest departments in States that now lack them,

and of creating a demand for a larger, rather than a smaller, number of private foresters.

The problem of woodlot forestry appears to us to be, first, one of getting at the woodlot owner in effective fashion, and, second, of showing him what his timber is worth and how he can market it to advantage. Better silvicultural practice will follow almost automatically if the rank and file of the owners of small pieces of woodland once understand how to obtain the most for their products in the markets available to them.

To reach the woodlot owner effectively, we believe that much can be done through the Extension Service of the United States Department of Agriculture. In cooperation with colleges of agriculture and other state agencies, this Service maintains nearly six hundred local demonstrators in scientific agriculture, forming in the aggregate a tremendous and direct personal force for bringing home to the farmer better ideas on farm management. It is probable that this organization, which has shown remarkable growth and vitality in the past, will be largely and widely extended in the future. It affords, to our thinking, a most effective agency for reaching the rank and file of the two or three million owners of woodlots throughout the United States. We believe that the farmer should be taught the best way to care for his woodland and market his products, in the same effective personal way that he is taught to grade his corn or rotate his field crops. Where this can be done by state forestry departments or state agricultural schools, the work should by all means be theirs. Where no local agency is prepared to do it, the Forest Service will, in cooperation with the Extension Service of the Department of Agriculture, fill the breach as far as it can.

To supplement this direct and practical demonstration of forestry to small owners, we believe the work of greatest importance now to be done is intensive study of the marketing of woodlot products. This is being undertaken by the national Forest Service in regions having distinctive problems, and will be ultimately extended in cooperation with state departments of forestry over all regions where the woodlot is an important factor.

No résumé of the principal lines of effort in national forestry during the coming decade would be complete without reference to the national problem of water conservation and flood control, in its bearing not only on the navigation of large rivers, but also on hydroelectric power, irrigation, municipal water supply, and all other uses of water. A very significant advance in national forestry was made with the passage on March 1, 1911, of the Weeks Law, in the terms of which Congress definitely said that the maintenance of forest cover in the interests of navigation is a matter of national concern, to be provided for by national effort. In the application of the broad policy laid down by that Act, fourteen areas, aggregating 188,904 acres, have been acquired as national forests on the headwaters of navigable streams in the Appalachian ranges, and additional areas aggregating 948,141 acres have been approved for purchase. Cooperative agreements for the protection from fire of additional areas on the headwaters of navigable streams are in operation with eighteen States, covering a further aggregate area of 15,000,000 acres.

The significance of this function, exercised and developed for a number of years on the national forests in the West and thus recently extended to important navigable watersheds in the East, is far greater than the figures quoted by them-

selves would indicate. They are the concrete expression of a definite national policy looking to the conservation of water; and they represent the beginning of a far-reaching public activity which, in its fullest development, may easily outstrip any public forestry yet undertaken, in economic importance and in vital bearing on the well-being of the great mass of the people.

The next decade will witness still more significant and effective applications of this phase of national forestry. The Newlands Bill, now claiming serious consideration at the national Capitol and very general support in the country at large, is in many respects the most far-reaching measure for forest conservation ever proposed in this country. It contemplates not only the protection of the forest sources of streams through public ownership or fire protection at public expense, but also the systematic building-up of such sources where they have been destroyed, by reforestation and by improved methods of agriculture. And all this is but one part of a far-reaching policy of conserving streams which includes vast engineering works as one of its essential features.

It would be unwise to prophesy when such a measure will be enacted, or the precise form in which its fundamental principles will be placed on the statute books. Certain it is, however, that the next ten years will witness a significant and far-reaching extension of national forestry, as part of a broad scheme of water conservation, along these or similar lines.

After sketching this somewhat comprehensive program, you may naturally raise the query as to what activities in the earth, the heavens above, or the waters under the earth, are not included in the domain of national forestry. That query is but a testimony to the bigness of the whole field of American forestry. The field of national forestry is big because the whole field is big; and even if the Federal Government is able to do any considerable part of the work that I have indicated, there is ample room for all the efforts of all the other agencies that can be brought to bear. There is room for all, and more than enough for all to do.

No one has appreciated better than the men in the Forest Service the remarkable advance made within a very short period of time by the forest schools, by state forest departments and other official agencies, and by the profession of private forestry. To all these coworkers we give our heartiest recognition, and an expression of our earnest desire for community of purpose and interests and for continued cooperation growing more effective as our work becomes mutually more clearly defined. We have no pride of organization in continuing or attempting phases of work in forestry which properly fall to local agencies, or which local agencies are better prepared to do than we are. Gladly will we relinquish to them any part of the big field that they are prepared to care for. And it is particularly in this spirit of recognition of the splendid achievements in forestry by the State and other local agencies, that we congratulate Cornell on the success of her work and wish her Godspeed.

FORESTRY ON THE FARM

BY W. H. VARY, WATERTOWN, NEW YORK
Master, New York State Grange

It is a great pleasure for me to stand before this magnificent audience on this auspicious occasion and to be accorded the honor and privilege of taking part in these opening ceremonies. I understand that many of you are from other States, and I heartily bid you welcome. It is the greatest State there is in this United States, although some of you perhaps control a greater territory.

I want to speak of the number of persons that I represent. If you were all New Yorkers I should not have to say anything about it, but, as I was told last evening, thirty-five States are represented here. I stand before you this morning representing an organization of 100,000 people, composed mostly of those who are tilling the soil in order that they may earn bread for their families and bread for you who are unfortunate enough not to live on the farm.

We have been interested in the College of Agriculture since its inception and before any of this magnificent group of buildings were erected. The New York State Grange took an active part in securing an appropriation for the erection of the first building of the many that now adorn this section of the campus, and we take pride in the work that has been accomplished by this great institution. We believed it to be no more than fair and right that the Empire State should provide a college wherein the youth of our land might be taught the science of agriculture. We did not ask this solely in the interests of the tillers of the soil, but we believed it to be for the best interests of all the people of the great State of New York that this be done. And we believe that our contention along this line has proved true.

Not only have our fondest hopes been realized to a large extent, but in many ways our expectations have been exceeded. One building after another has been added to the nucleus, until we have an array of buildings in which the youth of this State may be taught the science of agriculture and domestic science in all its branches. For our crowning glory we celebrate to-day the completion of this beautiful building which is to be devoted to a branch of agriculture—forestry. It is not for me to undertake to give instruction along this line; but I feel very sure that if the ones chosen to preside over the instruction that is to be given in this beautiful new building are as competent and faithful as those instructors that have presided over the other departments during the years that have passed, we shall have no cause to complain.

Farm forestry is not a new subject. It has been talked about for many years, but with little interest and no enthusiasm except from a very few who, having made something of a study of conditions, have come to realize something of the necessity for work being done along this line, that we might not only conserve the farm woodlot, but at the same time have it increase in value. It goes without saying that we have been wasteful and extravagant in the use and management of our small timber plots; and to-day a large number of our farms are entirely destitute of growing timber of any sort, while exactly the reverse should be true and doubtless would be if we had had proper instruction along this line and had heeded the instruction and put into practice the lessons learned.

On nearly every farm in the State there is an area of ten to twenty acres, more or less, that could well be devoted to the growing of trees. In very many instances

the land could be used for that purpose to better advantage than for any other crop. Why not do it? With the visible supply of timber rapidly disappearing, it behooves each and every tiller of the soil to add his mite toward checking present conditions; and after a few years the result of such labor will manifest itself and there will be thousands, yes, millions, of dollars added to the wealth of this State through an increased supply of timber, which is so necessary for the welfare and convenience of the citizens of the Empire State. We hope and trust that under these improved conditions for teaching farm forestry, many more students than ever before will seek instruction in this important subject, and will demonstrate to the Legislature that the funds appropriated for this splendid building were expended for a useful purpose and that the State will reap a hundred-fold on the investment; that the instruction here given shall redound not only to the honor and benefit of those who receive it, but to the citizenship of the entire State.

In closing, let me urge you young men, and you fathers and mothers who have young men in your homes, to take advantage of the opportunities offered and to profit by them. The importance of tree planting from a financial standpoint cannot be overestimated; and, besides, there will be a real joy and pleasure in the years to come to those who did the planting, when they point with pride to the young forest that they were the means of creating.

FORESTRY AS AN INVESTMENT

BY CHARLES M. DOW, JAMESTOWN, NEW YORK

Director, Letchworth Park and Arboretum

My keen pleasure over attending so notable a gathering as this is somewhat overshadowed by my realization of the difficulties of the question that I have been called upon to discuss.

For many years it has fallen to me as a banker to study the character of investments in the wide field of industry and of commerce. I have, as a result, reached in my own mind certain convictions as to what measure of stability and security, and what money returns in the form of profits, are necessary in order to render an investment desirable from the viewpoint of the investor. But you have called upon me to discuss, not banking finance, but forest finance; and you have asked me to expound my views before an audience containing some of the most distinguished foresters in America!

When a man is called upon to deliver an address on a subject with which his acquaintance is not of an intimate nature, two courses are open to him. One is to recognize discretion as the better part of valor, and to decline as gracefully as possible; the other is to accept, and simultaneously to turn for inspiration and enlightenment to the literature of the subject. Thus it was that, when I accepted an invitation to address you on forestry as an investment, I was sustained by the hope that I should find ample basis, among your textbooks on forestry, for an epoch-making speech on this very important question.

Rude was the shock that awaited me. For, while my forestry library is fairly ample, and contains, of course, those volumes on forestry that the world owes among others to your distinguished selves, vainly have I searched among my shelves for that fount of knowledge regarding forestry as an investment for which

I thirsted. I found full and detailed information on a broad range of subjects; nor was there lack of specific and authoritative treatises on how to grow forests, how to protect forests, and how to perpetuate forests; but there was a singular and striking absence of anything more than casual and passing reference to the somewhat practical question of how much the man who grows, protects, and perpetuates forests may expect to receive in revenues from his investment. I was finally forced to the conclusion, either that my library is sadly deficient, or that you have called upon a banker to discuss a subject of such complexity that the foresters have not yet seen fit to treat of it themselves!

But, whatever may be the explanation, I have been thrown, as you can see, entirely on my own resources; and I ask the fullest measure of your tolerance for what I shall have to say. I am no forester, as you are aware; and you must expect from me no elaborate and technical treatment of the elements of forest costs and forest revenues. Nor shall I deal in matters beyond my ken, such as the choice of a financial rotation, "expectation values," increment and growth percentages, and the vexed question of overhead charges, forest taxes, and the costs of fire protection. No, I shall merely state, briefly and frankly, what I, as a man of some experience in business affairs, believe to be the fundamental considerations involved in the whole vital question of the profits from forest conservation.

It is clear, to even a layman such as myself, that there are two great classes of forestry when one considers forestry in the light of its returns. The primary purpose of what is well called "public forestry," as practiced by the nation and by the States on forest lands in public ownership, is seldom the production of a money revenue. Its returns lie rather in those contributions to the general welfare made by the conservation of stream flow, by the upbuilding of forest communities through the assurance of a sustained supply of timber, and by the development of the fullest permanent usefulness of the forest as a source of health, recreation, and other general broad benefits to mankind. Such is the great function of the national forests, which they so admirably fulfill under the policies inaugurated and first put into effect by Mr. Pinchot, and now so efficiently continued by Henry S. Graves. It has always seemed to me that the money returns from the national forests, large as they are in the aggregate, are of trifling importance compared with their vast beneficial function as sources of wholesome opportunity for betterment, development, health, and pleasure to our people.

The national forests are to the great West what fuel is to the steam engine and food to the human machine. They supply in timber, in forage, and in water power, the basis and the stimulus for industry and for growth. The true measure of the value of the national forests as a national investment lies in their contribution to the material prosperity of the West; it lies in fruitful farms irrigated by forest-fed streams, where used to grow only a dusty mantle of sage brush above the sun-parched soil; it lies in the great woodland pastures, on which, under regulated use, are feeding each year vast and steadily increasing numbers of cattle and sheep; it lies in the whirring sawmills, which are turning the product of mature trees, harvested skillfully so that a second crop is growing where they stood, into lumber for use in every industry. No, my friends, let us see beyond the entries in the cash book and the ledger, when we seek to estimate the usefulness of the national forests to America.

Thus we are led to turn, in the consideration of forestry as an investment, to the forest lands in private ownership. These contain, as you are aware, probably not less than four fifths of all standing timber in America, only one fifth of our natural forest wealth remaining in the ownership of the nation and of the States. For not only have we wasted our formerly vast forest heritage; we have also, through a discreditable combination of indifference, of loose land laws perfunctorily enforced by careless public officers, and of actual subservience to the great timber interests, allowed most of the forests of America to pass out of public hands. The result is that the nation controls only in small part the use of a resource of which a permanent supply is indispensable to our continued material prosperity.

It is indeed a national calamity, the magnitude of which we do not even yet fully recognize, that we did not awake in time to the need for the application of the leasing system to forests, now so earnestly advocated for our remaining water powers and coal measures. I am a firm believer in the retention in public hands of the land that is the source of the natural resources, whether timber, water, or minerals, which are essential to the public welfare, and in full provision for their prompt and orderly development by private enterprise, on terms that will prevent monopoly and protect the consumer.

I have watched with keen interest, for example, the progress of the forest policy of Canada, where, in the West and in the East alike, in British Columbia and in Quebec, the so-called "timber limit" system is in operation. As you are doubtless aware, that system is open to certain just criticisms in the details of its application; but it seems to me to contain the germ of an admirable national policy toward the forests—a policy that sees straight to the vital need of timber for all time, and leaves the ultimate control of the timberlands in the strong hands of the Government. Our friends to the North of us need never fear, as we need fear, provided their Provincial Governments and their Dominion Government are faithful stewards of the people, the menace of unregulated monopoly of standing timber, or the menace of a fast-dwindling timber supply.

Now, gentlemen, to face squarely this vital question of forestry as a permanent investment on private forest lands: What are the requisites of every sound investment, whatever the field in which it lies? First, there is the prime requisite of security. The industry in which the investment is made must possess within itself a reasonable assurance of continuity. As a general rule, the safest and most reliable investments are those that deal with the necessities of life, not with its luxuries or its minor accessories. I would, as a permanent investment security, class a coal mine higher than a diamond mine, a flour mill higher than a theater, a grocery business higher than a moving picture business; for, while the others might easily yield higher returns, they would not possess the element of stability which characterizes any industry concerned with the essentials to human existence, such as fuel and food.

Timber is, and always will be, one of the necessities of our modern civilization, and it will continue to be in large part essential to our very existence. Next to our need of food and water comes our need of wood; and, while certain substances are to a certain extent replacing wood for certain purposes, the possibility is too remote to justify serious consideration that any such so-called substitutes will ever completely satisfy the vast range of uses to which wood, by its strength, lightness, elasticity, and working qualities, is so eminently adapted.

We are prone, in estimating the effect of substitutes in general on the demands for the material that they profess to replace, to fall into certain fallacies. The invention of the steam engine aroused a loud outcry on the part of labor against this invasion of its field, based on the genuine fear that there would soon be no manual labor left for men to do. And to-day some of our friends among the lumbermen are predicting the end of their industry because the railroads are adopting steel instead of wood for car construction, and because iron and cement are entering more and more largely into the construction of buildings.

It is one of the cardinal principles of what we have come to call the "conservation movement," that the usefulness of all the great resources of natural wealth is interdependent. The same is true of all industries. There is no great industry known to me, whose progress is not in a very large measure determined by the progress of all other industries; and I say to you, after a minute and somewhat extended observation of industrial development in the United States, that the usual effect of the introduction of any so-called substitute for a staple of industry is, by stimulating development in general, to diminish the aggregate use of the staple in question very slightly if at all. Turn to your statistics of the consumption of wood in the United States, and you will find that not only the aggregate consumption, but also the per capita consumption, has increased instead of diminished with the decades. Why? Simply because the tide of development in all industries—and every industry uses wood in one form or another—has much more than compensated for the falling-off in demand that has taken place as the result of the employment of other substances, such as steel and concrete, to take the place of wood. I think, therefore—and I am speaking with the caution of the banker, not with the enthusiasm of the forester—that we may safely assume that timber, the product of forestry, will continue to be indispensable to our civilization and to our material prosperity, and that, in so far, forestry qualifies as a sound investment.

Now, what further questions remain? There are two. One is the question of the actual physical safety of the investment, the other the question of its actual money returns. Safety is, of course, a vital consideration; for, however high may be the rate of interest, any investment that entails unreasonable risk to the capital invested is not an investment in the proper sense, but rather an excursion into that realm which is strewn thick with so many failures—the uneasy realm of speculation, where the lure of quick and easy money somewhat obscures the shoals and quicksands of financial disaster.

You would not, unless you were a speculator rather than one in search of a secure investment, risk your money in the purchase of an unseaworthy vessel, unfit to meet the perils of the deep staunchly and successfully, no matter how high might be the returns in freight charges on the cargoes that she carries from port to port. You would not invest your money in a rich delta farm, yielding abundant crops but always subject to destruction by overflow. Nor would you invest, unless your eagerness got the better of your forethought, in any other enterprise in which the margin of safety was so low as to involve grave and constant risk not only to interest but to capital itself, from causes wholly beyond your control.

Now what are the risks involved in forests and forestry? Strikes, periods of business depression, panic, floods, ruinous competition—the safety of the forest is not menaced, as is the safety of most other investments, by any of these. The

forest faces only one great danger, but that is the greatest danger of all: the possibility of complete destruction by fire. But, gentlemen, we are not discussing the value of forests merely as an investment, but the value of forests handled under the principles of practical forestry. So the question that we now face is whether, from the point of view of the investor, the application of practical forestry to the forest makes it so safe from the ravages of fire as to render the ownership of a forest, and its treatment with a view to the production of a continuous supply of timber, a secure investment from the business point of view.

If that question had been asked of us twenty years ago, when the smoke of the forest fires dimmed the sky in every great forest region in the United States, it would not have been easy to answer. Those were the days when forest fires were placed by most men in the same general category as floods, pestilence, storm, and earthquake—as visitations or disasters over which men had no control. But twenty years have worked a wonderful change in that respect. And the credit for the change is due above all to the zeal, the efficiency, and the brilliant success of American foresters. It is they who have demonstrated to the satisfaction of even the most skeptical that forest fire protection in America is wholly practicable at a reasonable expense.

American foresters have not only preached forest fire protection and its manifold advantages; they have also practiced it effectively in the face of great difficulties, in the woods. As a result, they have shown that it is no more inevitable that fire should destroy a forest than that it should destroy a city, and that in the forest, as in the city, the weapon which can and does reduce fire hazard to a minimum is simply a reasonable measure of skilled and watchful preparedness.

I believe that great achievements still lie before the forest conservation movement in America. But that movement can hardly ever put a more valuable achievement to its credit than the practical demonstration already given in America that forest fires can be held in check at a cost per acre which, in view of the value of the forest property protected, is about the lowest rate of fire insurance of which I know. Not only have you, by fire lines and lookout stations, by your trails and your telephones, by your watchful system of fire patrol, made safe from fire damage the vast timber wealth of the national forests and also of state forests such as our own here in New York; you have also—and therein lies possibly the most conclusive evidence that not only has your fire protection been successful, but that it has been successful at reasonable expense—inspired private owners to follow your admirable example. As the result, in Oregon, in Washington, in Idaho, and in several other Western States, associations of lumbermen have banded themselves together to protect, by vigorous cooperation under one harmonious plan, the vast aggregate of their individual private forest holdings under the fire patrol methods of the Forest Service. The force of the great example in thrift afforded by the conservation of the national forests has reached even farther, and I am told that within the last few months there was organized for similar purposes an association consisting of the great timber holders of the Province of Quebec, who see in the patrol methods applied to public forests in the United States the only sure means of protecting their own forest holdings.

Obviously, I do not mean to imply that our national task in fire protection is as yet fully performed. There is still, in the aggregate, vast and unnecessary forest fire damage each year in the United States. Possibly fifty million dollars

would be a moderate estimate of the annual destruction of standing timber by forest fires; and if we were to include an estimate of national loss from the destruction of young growth, the basis for the commercial forests of the future, the figure might conservatively be placed at double that amount. But, while we still pay as a nation a heavy price for carelessness regarding forest fires, there is no lack of practical object lessons to prove conclusively that forest fire protection is possible, not merely in specially favorable seasons, but even when the seasons are unfavorable through a combination of causes such as severe drought and high winds. For even in such seasons it has been shown, on the national forests and elsewhere, that there is no notable menace from fire on the forest which is adequately patrolled, and which is adequately equipped with telephones and trails to render the patrol still more efficient.

To sum up, therefore, my best judgment is that a forest properly protected and conserved under the methods of forestry, constitutes, in the strict financial sense, an unusually safe investment as compared with investments of the other great classes, such as stocks and bonds in industrial, commercial, and manufacturing enterprises.

As you will recall, we established three conditions whose fulfillment is essential before an investment may be fairly classed as desirable. The first was security, the second safety, and the third and last is the matter of financial returns.

What rate of income from an investment is necessary in order to render it desirable, as compared with other investments? As you may easily imagine, I am somewhat frequently asked that question. My answer is that as a general rule, subject of course to certain definite exceptions, an investment which is safe and secure and which at the same time may reasonably be expected to yield continuous interest at the rate of four to five per cent a year is a good and desirable investment. Where an unusually high degree of safety and security is assured, the assurance of three to four per cent interest also constitutes in the financial world a good investment.

Now the practical question remains, what money returns can be expected from the practice of forestry? I think the statement is correct that the net returns from the conservatively managed forests of France, Switzerland, and Germany varies, according to local conditions, between three and four per cent. So far as I am aware, no attempt has been made as yet to estimate in detail what returns may be expected from the similar practice of forest conservation under American conditions. But when we take into consideration the conditions that we confront in America, and the conditions in Europe, does the comparison go to show that we must expect lower returns, or that we may expect higher returns, from forestry in America than abroad?

After weighing as best I can the relative factors in Europe and in America that go to influence net returns from forest conservation, I incline strongly to the belief that forestry will pay at least as well here as it does abroad, and may easily pay materially better. That belief is predicated, not on the conditions of to-day—nor does forestry deal with the conditions of to-day—but on the conditions that we may reasonably expect in the not distant future.

We face in America a rapidly increasing shortage in our timber supply, as a direct result of our national wastefulness with respect to the forest. Germany and France face no such shortage. We face also in America the fact that timber in

general is bringing on the stump far less than it costs to produce it. In other words, it would cost more, sometimes two or three times as much, to raise one thousand feet board measure of commercial stumpage than it will sell for at present stumpage rates. To what conclusion does that lead? It leads to the logical conclusion that we may expect with certainty sharp increase in stumpage values; for in the last analysis every useful crop—and timber is a crop—will bring in money, not only as much as, but a little more than, it costs to produce it.

In no other country have stumpage values increased so rapidly as in America in the last decade. I think it is a fair statement that the stumpage values of species such as yellow poplar, white pine, spruce, and long-leaf pine, have increased in the last ten years at the rate of not less than ten per cent. It is not difficult to indicate a considerable class of far-sighted lumbermen in the United States who have grown rich beyond the dreams of avarice in a short period, simply by purchasing standing timber at current stumpage rates, holding it in order to take advantage of the current increase in stumpage values, and then selling it again.

In other words, the man who practices forestry in America to-day may fairly assume an interest on his investment, not only through the actual increment of the forest itself created by the production of new wood each year, but also through a considerable added increment and interest due to the steady rise in the value of all classes of commercial stumpage.

My earnest conviction, based on readily available facts, is that it may be conservatively assumed that, under favorable forest conditions in America, forestry may be expected to yield a net return on capital invested therein of somewhere between four and five per cent at present, and that in the not distant future it may be expected to yield materially in excess of that income. The rapidly increasing value of stumpage in itself affords excellent assurance that, disregarding actual growth, the man who buys forests and conserves them will make no less good an investment than the man who invests in other great classes of reliable business securities.

Gentlemen, my investigations into the field on which I have had the temerity to address you to-day have led me to a very definite conclusion, which, out of my deep interest in forestry, I shall take the liberty to express. It is my firm conviction that the application of forestry to private lands in America can be greatly extended, if American foresters will devote more attention to laying before private forest owners the essential facts regarding the money returns to be expected from forestry. I believe, as I have stated, that you have ample ground for your strong conviction that not only is forestry desirable from the viewpoint of the nation, but also it is a good investment for the individual. But before you can reasonably expect the individual to turn with eagerness toward forestry as an investment, you must lay before him—and lay before him not in general terms, but in specific terms—concrete information as to what forestry will cost, and what revenue it may be expected to yield in the given case. I am eager to see a more united and more extensive effort made by foresters in general, to furnish to the possible investor in forestry the authoritative and detailed knowledge of its financial advantages which any investor of discretion requires as to any opportunity for investment before he acts.

I make this suggestion with the more confidence, since it is one with which foresters to whom I have spoken regarding it have expressed themselves in entire sympathy. It is this conviction that has led in part to my deep and abiding interest in the forest arboretum at Letchworth Park, now in process of formation. As I need not say to you, the creation of a forest arboretum is a slow business; and a considerable number of years will have to pass, before our blocks of planted forest on the banks of the Genesee will have ripened into the practical object lessons that they are intended to supply. But one of the chief purposes of the Letchworth Park Arboretum is to demonstrate by actual test, and to preserve by careful records, the actual results to be expected from planting forests, not only silviculturally, but also in terms of dollars and cents.

Let this, then, be the final word to you from one who makes no claim to be a forester, but who has an abiding and earnest interest in forest conservation. In the last analysis, the question of how rapidly private forestry is applied to private forest lands in the United States is not a question of silviculture primarily, nor a question of the general welfare primarily; but it is primarily a question of the actual financial returns that the individual forest owner may expect from forestry. Until you have supplied him with all the facts available bearing on the profit from forestry, you will not get his active interest, and the area of private forest lands under conservative management will not materially increase. I earnestly commend to your attention the need of a practical textbook on the finance of forestry, expressed in terms so plain and so direct that the layman can clearly comprehend it. The time has fully arrived, in my judgment, when the forest owners of America are ready to make use of information of that kind. You have already aroused in large part their keen interest in forestry. Your next task lies in getting that interest expressed in terms of better work in the woods. That calls, above all, for the plain facts as to what better work in the woods will cost, and what revenue may be expected from it.

THE WORK OF THE NEW YORK STATE CONSERVATION COMMISSION

BY C. R. PETTIS, ALBANY, NEW YORK

Superintendent of State Forests

The Conservation Commission is one of the largest of the state departments. There are a few of greater size, yet none with wider scope or entrusted with more important work. Its activities fall into three general divisions: Lands and Forests; Fish and Game; and Inland Waters. The organization of the commission is such that there are in each division men technically trained for the particular duties.

The Division of Inland Waters includes river improvements for the sake of public health and safety; exercises control over private water companies furnishing potable waters; conducts investigations of the hydraulic resources of the State; regulates the erection of structures in streams; and supervises drainage of lands and disposal of sewage. The Fish and Game Division not only propagates, but also enforces, laws of a protective character. Hatcheries to propagate fish, farms to rear game birds, and lands under water to produce oysters, are operated.

The activities of the commission are so great that one could not, in the few minutes allotted, attempt to give you a comprehensive idea of all its functions.

With this general reference to the two divisions named, I will pass on to the third division, that of Lands and Forests, because I assume its work will be of particular interest. An enumeration of the affairs of the Lands and Forests Division will therefore give you an insight, not only into the work of the commission, but also into that which its foresters are supposed to be able to do.

The administration of the state forest lands is an important matter. The Forest Preserve is in area more than twice the size of the State of Rhode Island. It embraces 1,826,000 acres, which lie intermixed with more than three times this area of private property; it is situated in sixteen counties; it consists of nearly seven thousand parcels; it is bounded by more than nine thousand miles of lines; and its commercial value, to say nothing of its indirect benefits, is upward of twenty-five million dollars. The location of these lands is at times difficult, because, during the century or more since the original lines were run, the blazed trees marking them have too often been removed by decay, lumbering, or fire. The original notes of these surveys are often difficult to obtain, and sometimes cannot be located. Establishing and monumenting these boundaries requires searching for the old lines and a resurvey. The forester thus becomes a surveyor. Protecting this vast area from trespass is no simple matter. It requires knowledge as to the location of these extended boundaries, character of the inhabitants, location of exposed areas in order to insure protection. When trespasses do occur, it is then necessary to secure proof of cutting and make computation as to quantity of material based on stump measurements. The forester hence becomes a protector, an investigator, and must develop certain legal ability. After all these facts have been secured, he must furthermore be able to make and prepare a certain abstract of title of the lands. This requires the forester to not only know real estate laws, but also be familiar with court decisions on these points.

The commission has also the power to purchase additional lands for Forest Preserve purposes. Such lands must be located and carefully examined. The forester, therefore, becomes a timber cruiser and an appraiser of forest property.

One of the very important duties is the protection from forest fire of an area nearly as large as the States of Massachusetts and Connecticut combined. The plan contemplates, first, preventing as many fires as possible, and, second, maintaining an organization competent to extinguish promptly all fires that cannot be prevented. Fire protection is a science. Experience shows that certain causes, times of year, places, and conditions are the controlling elements. The burned areas have been plotted on maps, and thus the places that experience shows are most likely to burn are first guarded. The next step is to eliminate causes. Causes are carefully determined, tabulated, and plotted. Carelessness is the great producer of forest fires, and by education we aim to reduce this danger. Circulars, placards, reading notices, lectures, and other similar methods are used in this campaign. The forester, therefore, becomes not only a protector, but also an educator and an advertising agent. The law requires that the 6900 railroad locomotives operating in this State shall be equipped with certain spark-arresting devices. The equipment of engines to comply with the statute requires not only inspection, but also the approval of plans. The forester, therefore, becomes a mechanical engineer.

The fires that cannot be prevented must be detected as soon after they originate as possible. It has, therefore, been necessary to devise a scheme that will insure

a general oversight of this extended region. Telephone lines, reaching to the top of fifty-one mountains, have been constructed. An observer is maintained at these points, with glass and map for the purpose of detecting and locating fires and dispatching assistance.

This system has necessitated the installation and maintenance of two hundred and thirty miles of telephone lines. The forester, therefore, becomes a telephone engineer. The efficiency of this system is shown by the fact that, under the old method, million-dollar fire losses were sustained in both 1903 and 1908, while in 1913, under similar drought conditions and with a larger number of fires, the present method reduced this loss to less than \$90,000.

Another very important work is reforestation. There are few people who appreciate that 2,500,000 acres, or 13 per cent of our State, which is fit only for forests, lies idle while we send out of the State for large quantities of our lumber. In order to assist in placing the land in economic use, we operate seven nurseries containing fifty-six acres having a capacity of 28,000,000 trees. These are probably, in point of quantity, the largest nurseries in the country. This not only entails a vast amount of work in seeding, transplanting, and shipping trees, but also requires expert labor in order to secure results. The sale of trees to private owners aggregates about five million per year, and much additional stock is grown for state lands. The conduct of these nurseries is a business of about \$40,000 per year. The sale of trees means advertising and educational work in order to interest the private planter. The forester in this instance becomes a nurseryman and a business man.

The field planting requires knowledge of soils and the requirements of species, and the application of the principles of silviculture. Advice is furnished to private owners, and in some instances planting plans are prepared. Advice is also given and plans are prepared for the management of farm woodlots.

The forest lands of state institutions have been examined and are now being managed under plans prepared by our foresters. This not only results in an increased return from such lands, but also serves as a demonstration of forest management in various parts of the State. At one institution nearly \$20,000 worth of fire-killed timber that was going to waste has been sold. These institutions are planting a million trees per year on their idle non-agricultural lands.

This commission also conducts investigations in regard to methods of reforestation, matters relating to forest fires, growth of trees, and yields of forests, and to tree diseases.

The Forest Preserve, St. Lawrence Park, and Cuba Reservation are used for camping and recreation purposes. This use enforces additional duties in an administrative way, and requires the maintenance of various buildings, docks, dams, and other structures. The old homestead of John Brown, and his grave at North Elba where "his body lies a-mouldering," are also under our care. In order to accomplish these purposes the forester must have tact and some knowledge of carpentry, masonry, landscape work, and allied matters.

At other times our energies are directed to the preparation of bulletins or to giving talks on forestry subjects.

We also gather and compile statistics as to the lumber and other forest products of the State.

In closing, there is another and important duty that the commission too often has, but should not be required to do; and that is, to convince the finance committee of our Legislature that money is needed in order to conduct this all-important work.

The foregoing will in brief give you an outline of what forestry in the State Conservation Commission comprehends. The work is an ever-changing, mixed, and complicated problem, continuing year in and year out, presented by hundreds of persons in as many aspects, and varying from minor requests that can be granted with a smile to scores of lawsuits that must be fully prosecuted.

The success of our work is marked. The Forest Preserve is being protected and safeguarded. The forest fire loss has been greatly reduced. The reforestation of idle lands is rapidly increasing. The people generally are beginning to appreciate the possibilities of conservation, and that it has a personal meaning to all.

THE TRAINING IN FORESTRY DURING THE NEXT DECADE

BY JAMES W. TOUMEY, NEW HAVEN, CONNECTICUT

Director, Yale Forest School

I have been asked to look into the future and interpret the progress in forestry education during the next decade. At first thought, this task may appear an impossible one, particularly so as we glance backward over the past ten years with their almost kaleidoscopic changes and rapid progress in matters relating to forestry. To-day, however, the task as I conceive it, when compared with what it would have been ten years ago, is not one of extreme difficulty or uncertainty. We are now just completing what may well be termed the first period of forestry education in the United States, and are able for the first time to get a back sight along the landmarks of our progress. From this we are able to project a reasonably accurate path into the future. Permit me to offer a rapid survey of these landmarks of the past, and from them lead you into the coming decade of forestry education in the United States. The landmarks of the past relate to the origin of the schools, the multiplication of schools, the character of the schools, the expansion of courses, and the great diversity in the quality and kind of work embraced in professional training.

As early as 1887, Doctor Fernow gave a course of lectures on forestry at the Massachusetts Agricultural College. This, I believe, was the first instruction in forestry given by a trained forester in any educational institution in the United States. Ten years later a private school was established at Biltmore by Doctor Schenck, which continued in operation until the present year. In 1898 Doctor Fernow organized and became the Director of the New York College of Forestry at Cornell University, which, although abandoned three years later through lack of state support, may well be termed the mother of Cornell's present Department of Forestry. It was the first institution of collegiate rank on the American continent to give instruction in forestry. The splendid work of the old college and of the present department has been such that the State is honored in erecting this magnificent building, which we are dedicating to-day, to be used for the furtherance of forestry in the State and in the nation. In 1900 Professor Graves organized and became the Director of the Yale Forest School, the first graduate school

of forestry and now the oldest school in continuous operation in the United States. A few years later, a department of forestry was organized under Doctor Roth in the University of Michigan.

I desire to call particular attention to these older schools of collegiate grade, because of the tremendous influence that they have had in shaping the direction of forestry education during the past decade. All other schools are, in a sense, offshoots from them, as their faculties have been largely drawn from among the graduates of the earlier schools. Their curricula, in whole or in part, have been transplanted from the older schools. It is interesting to note that these schools were organized on a high plane, with experienced men in their faculties, largely drawn from the national Forest Service. At the time of their foundation, the majority of the people were either opposed to the aims and methods, or were indifferent or ignorant regarding the necessity and purposes of forestry. The tremendous impetus in national and state forestry coincident with the development of these schools, and their inability to supply *at once* all the men required by the national and state governments and for private work, stimulated to an inordinate degree the development of facilities for forestry education and the multiplication of schools in the United States.

Forestry has never been put on a permanent basis in any country except by professionally trained men. With traditional American enterprise, schools to supply these men began to spring up at every side. Horticulturists, botanists, and others with little or no forestry training or experience were often called upon to train men for this new profession. The multiplication of the schools has gone on until we now have in the United States twenty-one colleges and universities that offer degrees in forestry and announce that they train men for the broad fields of national, state, and private forestry. Of the collegiate institutions, eighteen, at the close of four years of satisfactory work, offer the degree of bachelor of science in forestry, and one the degree of forest engineer. Six institutions, at the close of an additional year of graduate work, offer the degree of master of forestry or of master of science in forestry. In two institutions the work is wholly of graduate character, the degree of master of forestry being given for two years of satisfactory work. After less than fifteen years of development in forestry education in the United States, we have more schools that aim to prepare men for the profession of forestry than there are in all Europe after more than a century of forest school development.

Although the older schools, when founded, had few textbooks of American origin and but little indigenous literature, they were headed by men experienced in forestry not only in this country but abroad. They were founded with the determined purpose of setting a high standard in forestry education in the United States. Although the curricula at first were unstable, imperfect, and juvenile, they have grown with the demand for professional training and are now maturing into adolescent form. This development, however, has been possible only in the schools in which the faculties are composed of specialists in the various branches of forestry. No institution with but one or two instructors in forestry can hope to develop a curriculum on an acceptable plane.

During this first period in the development of forestry education in the United States, there has been a great demand for men to organize and make effective the work in forestry on the national and state forests. The work has been largely

administrative and non-technical in character. Going along with the demand for men and the rapid increase in schools, there has been tremendous pressure for "short-cut," or so-called "practical," training, and the elimination of the fundamental studies and theory which, in reality, raise forestry to the dignity of a science. On the whole, men have not been trained to the extent that they should be in order to think in terms of forestry. We have been inclined to overemphasize empirical methods and to underemphasize fundamental laws and theory. Our students have worked out the problems after the formulæ have been given them; we have not required them to develop the formulæ. We do not need to look far to find the reason for this pressure for "short-cut" training. It has been chiefly due to the demand for men, and to the fact that good administrative officers are more important in the organization of the public forests than men with superior theoretical training.

Because of the relatively large number of excellent positions awaiting men trained in forestry, during the past decade and a half, our later schools of collegiate grade developed to supply them, nearly all under the direction of young graduates fresh from the older schools and with little practical experience. The methods, curricula, and ideals of forestry attained from graduate work in the older schools, and built on a thorough collegiate education, were transplanted into the new schools with insufficient modification to meet the real needs of the country. In the multiplication of the schools we have failed to recognize: (1) the need for forestry in our educational system from the public school to the university, where it should be a coordinate subject with agriculture and horticulture; and (2) the development of ranger schools, which should bear the same relation to professional training in forestry that the trade school bears to professional training in other subjects.

During the first period we have failed to realize that possibly we are developing a top-heavy system of forestry education. That is, with our present machinery for forestry education we are prepared to train too many men for professional forestry, and have not adjusted our general educational system to the acquiring and disseminating of information as to what forestry is, purely as a matter of intellectual attainment and useful knowledge. With our present machinery we are prepared to train too many men in professional forestry and too few in vocational forestry.

The progress of forestry is very largely a matter of public approval or disapproval. Public approval depends on how thoroughly the public knows what forestry is, what its necessity is, what its aims are, and how it can best be accomplished.

Public approval is necessary for the appropriations, without which national and state forestry cannot proceed. Public approval, based on knowledge of what forestry is and what results follow its practice, is necessary on the part of private citizens before they will undertake its practice. The great avenue for the education of the public in forestry is through our general educational system from the public school to the university.

An effective system of forestry education should have for its first duty the instruction of the millions, just the same as the first duty of an effective agricultural educational system is to instruct the whole public in matters relating to agriculture. The recognition of this duty in the field of agriculture during the

past half-century accounts for the progress of American agriculture and the adoption of economic methods. The recognition of this duty in the field of forestry education will measure our future progress in forestry.

Agriculture and forestry have close kinship. They both have to do with the production, harvesting, and marketing of crops grown from the soil. They differ chiefly in the length of time required for the crop to mature. Why should we not have state and county forestry institutes as well as agricultural institutes? Why should we not have training in forestry in certain high schools and higher institutions on the same basis as we now have training in agriculture without the expectation of turning out all professional men? Why should we not have, for the public, field demonstrations in forestry as well as in agriculture?

Not only have we given in the past far too little attention to the instruction of the public in forestry, but we have also been equally negligent of vocational training in forestry. The positions in forestry in the grades below and including rangers may be compared with the privates and non-commissioned officers in the army. The positions above that of ranger may be compared with the commissioned officers. In the army, scores of privates and non-commissioned officers are necessary to one commissioned officer. In forestry, scores of laborers, guards, and rangers are necessary to one technical forester. When one technically trained man will find a position suited to his attainments, many men will find work in lower positions.

The purpose of the ranger school is entirely different from that of the professional school. Its aim should be to train men for subordinate positions. The work of the ranger school should be from a different point of view from that of the professional school. As reported by the committee on secondary forestry education at the Fifth National Conservation Congress:

The ranger school should bear the same relation to professional training in forestry that the woodshop bears to research in technology, or the business college to university instruction in economics and commerce. It is analogous to the trade schools or a system of apprentice training whereby men are equipped for the skilled trades. Its primary object is, indeed, to turn out skilled workmen capable of doing all of the less technical operations required in managing forest lands and of directing unskilled labor as foremen.

Ranger school instruction must, therefore, aim to teach the art, or trade, of forestry practice, not the science of forestry. Its courses should be sheared down to those bearing directly on practice, on the things which the students are to be required to do, eliminating theory and all but the most essential of the underlying scientific principles. The method of instruction should be empirical, rather than deductive. It should take up specific problems of processes in the various fields of forest work and give the student specific answers and rule-of-thumb methods, with a minimum of deduction back to scientific causes and the application of scientific principles.

Although, within the past fifteen years, fifty-two institutions in the United States have developed more or less work in forestry below the grade of professional training, it has been largely without definite aim and poorly suited to the real needs of the country. This work has been conducted at ranger schools, academies, boys' schools, agricultural colleges, and universities. The amount and character of the work has been exceedingly variable in the different institutions. Very little of it even approaches the requirements of the ideal ranger school. In fact, the ranger school as a teaching institution yet remains to be developed in

the United States. I have diligently searched for the reason of its non-development, and have come to the conclusion that it is largely due to the problems of instruction. As the purpose of the ranger school is to teach the art, or trade, and not the science, of forest practice, the work can succeed only under the most skillful and experienced instructors—men who are not only familiar with the science, but who are also, through many years of practice, familiar with all the tools of forestry and can operate them with effectiveness and skill. Young men fresh from the professional schools are useless and helpless in ranger school work of the kind that is needed in the sound development of our educational system in forestry.

During this first period in forestry education, two high-grade technical journals have been established and have become factors of the greatest importance in disseminating the results of current investigations in forestry for the use of the schools and practitioners. During this period a number of forestry experiment stations have been established, but not usually in connection with schools. In the latter days of this period, technical books of American origin dealing with the various fields of forestry have been published in increasing numbers by the school men and by practitioners.

In concluding the first part of my subject, I find myself wondering whether we have built a solid enough foundation. Have we given enough thought and attention to the incorporation of forestry into our general educational system, and to the development of ranger schools? The schools must adjust themselves to the real and economic needs of the country, as the country sees these needs. It is an economic waste to develop schools and then say to the nation, the State, and the private forest owner, "See, here are many men whom we have trained for particular places. Use them." The development of the schools must be guided by a clear sense of the needs of the future, as interpreted, not by the schools, but by the public whom the schools serve.

Let us now project our path into the future, and see, if possible, what lies before us. Like education in every other field, forestry education must follow the path that the public demands. No matter how much the school men rebel, it counts for naught in the long run. We must shape our schools and our work to fit public demand as expressed in the character and scope of national, state, and private forestry. It would appear, then, that the most accurate location of this projected path depends not so much on what the schools want, or would like to do, as on what the public wants or would like to do. The schools and the school men are serving the public; the public is not serving the schools. The number, location, and grades of the schools, the books and other forest literature written by foresters, how and what is taught, must follow public demand.

I believe that now, at the beginning of the second period in forestry education, we can look forward to a more extensive introduction of forestry into our public school system from the secondary school to the university. Some work in forestry subjects is already given in the public schools of many States and in the undergraduate work of the department of arts and sciences in some of our colleges and universities. I also believe that the coming decade will see the general introduction of ranger schools into the system of forestry education in the United States. My belief is based on the present trend in both these directions, and their necessity as a support for professional forestry.

Heretofore our greatest progress has been with the professional schools. The system of forestry education that we have erected is much like a top. So long as it is kept spinning under the momentum of demand for professionally trained men, it will stand erect. Will not the checking of the momentum cause it to topple over? Is it not already beginning to wobble? Will it not be necessary to invert the top, so that its apex becomes the professional school resting on a broad foundation built on the education of the public in matters relating to forestry, and the education of men in the art of forestry as a vocation? Millions should receive instruction in forestry in our public schools, colleges, and universities, as a matter of useful knowledge; thousands should learn the art of forestry in ranger schools, in order to make them more effective and useful in their chosen vocation; while only hundreds should study forestry as a profession.

Every agricultural college and every agricultural high school should offer some instruction in forestry, but only a few should attempt to train professional foresters. Five or six years of collegiate work are necessary in order to train professional foresters, just as five or six years are required in order to train professional engineers, lawyers, and doctors, because the training must be built on a thorough educational foundation. Schools that combine the necessary training in technical forestry with the general educational subjects, and compass the whole in three or four years of undergraduate work, cannot give a thorough preparation for professional forestry. Undergraduate degrees in forestry necessarily mean that the foundation subjects have been slighted or that the subjects of technical forestry have not been thoroughly compassed. The schools that offer graduate work in forestry, either alone or in addition to their undergraduate course, are, in reality, the only professional institutions.

Unfortunately our educational system in forestry has been developed almost entirely around the demand of the national Forest Service for professionally trained men, although this Service controls less than one fifth of the total forest area of the United States. The transfer of the national forests to the Department of Agriculture and their organization under the Forest Service resulted in the demand for hundreds of trained men, which demand has only recently been supplied. This abnormal demand from a single source has blinded the schools to the real needs of a sound educational system in forestry. Is it not time that we were awakened to the rapidly increasing possibilities in state, communal, and private forestry, and the emphasis at least partially removed from national forestry?

Ten years ago only two or three States gave forestry any attention whatsoever; during the past decade, however, the progress in state forestry has been remarkable. Today thirty-three States have forestry departments, twenty-five of which are active and, for the most part, under professionally trained foresters. Fourteen States have established state forests having an aggregate area of nearly three and one half million acres. About forty-five men with technical college or university training are already in the service of the several States, and the number is yearly increasing. The expansion of state forestry has only begun, and the coming decade is certain to require the services of a constantly increasing number of trained men. Three and a half million acres of state forests is only a beginning.

Heretofore, in our professional training, we have given little thought to the possible development of communal forests. Many such forests, however, already exist in the New England States and elsewhere, which are sufficiently large to require in time the services of trained foresters.

The last decade has produced considerable change in the idea of permanency of ownership in private forests. Forest lands are beginning to be held as long-time investments. This means that the owners expect successive crops of timber. This expectation, however, cannot be fully realized without the services of trained foresters. How many professionally trained men can be profitably absorbed in the expansion of private forestry and lumbering during the next decade is uncertain. It depends very largely on our progress in the introduction of forestry into our schools and colleges, much as agriculture is to-day, and in our progress in acquainting the owners of forest lands with the purposes and results of forestry by means of field demonstrations and similar methods, which have been so useful in the promotion of agriculture. Last year the American Association of Farmers' Institute Workers held in forty-one States 20,640 sessions, with a total attendance, including attendance on agricultural trains, of 3,900,000 persons. This work is conducted by an army of trained agriculturists, and is only one of many agencies employed to educate the farming public in better agriculture. I look forward to seeing every technical forest school worthy of the name not only training young men in professional forestry, but also serving as a center for the education of the public, not only by lectures and institute work, but also by means of field demonstrations and practical assistance in the handling of forest property. Our system of forestry education in this country must move in the direction indicated. Trained foresters are needed outside the national Forest Service, and will be needed in constantly increasing numbers if the schools fulfill their duty to the public as well as to the students.

The number of professionally trained men who can be absorbed in national forestry yearly is not going to continue to increase as rapidly as it has during the organization of the national forests, after their transfer to the Department of Agriculture. The area of the national forests is not likely to increase, but is rather likely to decrease by the elimination of agricultural and grazing land. As time goes on, however, the intensity of management will increase, the working units will be smaller, and the present ranger districts, or even smaller units, will be in direct charge of professionally trained men. Where one professionally trained man is required now, one hundred will be required in the distant future. The number of men now in the national Forest Service who have received a degree in forestry at one of the various schools is three hundred and seventy-four. The appointment of technically trained men during the past three years has been as follows: in 1911, seventy-five; in 1912, seventy-five; in 1913, thirty-one. These appointments were made to fill vacancies and provide for the natural growth of the Service. It is not likely that the number of yearly appointments during the next decade will exceed very much the average of the past three years, even if men enter in somewhat lower positions than formerly. The amount of the grazing fees cannot be increased greatly over that of the present time. The increase in the annual receipts from timber sales will be gradual because of the competition of privately owned timber and the inaccessibility of many of the forests.

A constantly increasing number of professionally trained men must find employment on the four fifths of our forests that are privately owned. The greatest service that the schools can perform at the present time is reaching out to the thousands of private owners of forests and helping them to practice forestry

on their own property. Not only will this be of great usefulness to the public, but it will strengthen the schools and make their teaching more practical and virile. If we cannot spread out the foundation on which professional training in forestry rests in this country, it is an economic waste to continue building professional schools to train foresters.

The places available for the graduates of professional forest schools are determined by two fundamental factors—the number of men required to fill the places vacated by those now in practice who will drop out of the profession for one cause or another, and the number of men required to fill new places created through the healthy expansion of national, state, and private forestry. No more professional schools should be established than there is need for, or else the result is an economic loss, not primarily to the institutions themselves, but, most of all, to the men who are trained in them. It is bad foresight to train professional foresters to be forced later into farming, insurance, or various commercial callings. I do not believe it is sound economy to give men a professional training in forestry simply to chop down trees, gather seeds, and plant trees with their own hands. I do not believe it is sound economy to give men a professional training in forestry to perform for an indefinite period the work of a forest ranger or a woods foreman. I do not believe that a man with a thorough professional training has gained very much by his training unless there is reasonable opportunity for him to advance from the minor positions that he is called upon to fill immediately after graduation, where the work is largely of a manual character. Even if all obtain positions in the woods after graduation, it means very little unless there is an outlook ahead.

During the past two or three years there has been an undercurrent of thought permeating the forest schools, which has not as yet broken out into public discussion. This relates to the outlook ahead for the students now enrolled, and, with our present standard of professional forestry, the possibility of already having too elaborate machinery for this training. So long as the students trained in our schools all look forward to professional positions in the national Forest Service and in state work, there is grave danger that many will be disappointed. If we orient our present system, which I believe is the great necessity of the present time, so that it rests on a broad foundation of public education in forestry and vocational training, there will be room for all our schools. In order to do this, the schools must reach the forest-owning public by assisting and advising them directly in handling their property, in the same way that the agricultural schools assist the farmers through field demonstrations and similar activities. The opportunities for professionally trained men in private practice will be directly proportional to the activities of the schools in reaching out to the public and demonstrating on their own property the economic advantages of making their waste lands productive through forest culture and the handling of their present stands of timber with their eyes fixed on future crops.

If we do not orient our present system and create a larger outlet for professionally trained men in private practice, acceptable positions in professional work will naturally go to the graduates of the forest schools who have superior ability and training. The best schools will grow stronger, their faculties will mature, their work will become more effective, and their influence will be more widely felt. Schools not adequately equipped as professional schools of high standing will grow weaker. The inexorable laws of supply and demand, and the survival of the fittest, will work in forestry education as in every other field. Entrance into

professional forestry will be much more carefully guarded in the future than in the past. In both national and state work, examinations will be more technical, thorough, and rigid, and the qualifications that belong to the thinker and scholar will have greater weight. Only the exceptional man trained in the lower schools or self-trained will find it possible to pass from the ranger career to the administrative circle. Familiarity with certain features of the practice, gained through experience, will not suffice as it has so often in the past.

During the next decade, the professional schools will come to realize that the greatest stumbling block to the development of an adequate curriculum is the unfortunate belief that we must turn out graduates as fully trained foresters—the conception that we are preparing men in our professional schools to practice forestry, rather than the conception that we are training men to begin the practice of forestry. This belief leads us to overcrowd the curriculum and deprive it of elasticity and virility. Our aim should be to turn out, not finished foresters, but men who will continue to work and learn as long as they live—not walking encyclopedias, but scientific spirits. I therefore look forward to a contraction of required courses, now loaded with minor subjects, and a greater emphasis placed on essentials and fundamentals. Although every student studying forestry as a profession should have the fundamental training necessary for a practicing forester, there should be an increased opportunity for specialization. This will come in many of the schools, within the next decade, in the form of elective subjects in graduate courses.

During the coming decade we shall appreciate more and more the advantages that accrue from the careful study of forests long under management. The study of the forests of the Old World will become more and more the practice on the part of students of forestry in the United States. I look forward to annual pilgrimages to the forests of the Old World by graduates of our professional forest schools, following a well-matured and well-thought-out plan and under the direction of a thoroughly competent forester.

It has often been said that the European systems of forest management are not of much use in the United States, because entirely different conditions have to be dealt with. I do not believe that any sensible person has ever even suggested that we should adopt the European system *en bloc*. On the other hand, it seems foolish to ask us not to profit by experience gained in other countries. There are certain fundamental principles of silviculture, management, and other branches of forestry which are the same the world over. They differ only in that their intelligent application depends on local conditions.

In concluding this paper, I do not wish to leave a pessimistic view of the outlook in forestry education in the United States. If you will carefully consider the statements that have been made, I believe you will agree with me that they are fundamentally sound and, in reality, optimistic. The outlook for forestry development in the United States was never better. There will be a constantly increasing demand for trained men to meet the steady progress that forestry is now making and will continue to make. The need, however, will be for many privates to one commissioned officer, for the instruction of thousands to the professional training of one. Is it not time that we, the school men, realized this fact and began to shape our schools to meet the real needs of the country most fully and economically? If we do not, we may be fairly sure that they will in time be shaped for us, through the inexorable law of supply and demand.

PROBLEMS IN LUMBERING

BY FRANK L. MOORE, WATERTOWN, NEW YORK

President, Empire State Forest Products Association

I feel highly honored in being invited to speak to you to-day. For years I have been looking forward to the time when our universities and colleges would establish courses for the study of practical forestry. I want to congratulate Cornell University and her Board of Trustees on the completion of this magnificent building, dedicated to the training of young men who will devote their lives to ways and means for the perpetuation of our forests.

Conservation is the word to use. Like magic it has spread from the Atlantic to the Pacific. It has so taken hold of the popular mind that within a few years we have seen our State Legislature appropriate money to two of our leading universities for the erection of magnificent buildings to be devoted to the study of forestry. The success or failure of this department of teaching in a way rests with you and me and all the people of this State. We must be educated to the fact that trees are essential to our success and well-being. We must employ these young men who go out from this university to teach us and show us how to make the woods beautiful, and at the same time make them self-sustaining and self-perpetuating.

We want to see our natural resources so managed that the people of this State may learn that practical conservation may be practiced, and at the same time the grandeur and beauty of our mountains and lakes and woods and rivers be enhanced a thousandfold. By practical conservation I mean the utilization of the resources with which nature has endowed us.

In measuring time from the beginning, it is but a few short years since our forefathers landed at Plymouth Rock. Amazed at the vastness and richness of the natural resources that lay before them, they little realized that in a few short years human hands and human ingenuity would be called upon to regulate and control those same resources from which they carved out the foundation of the greatest nation in the world.

Yet, as the years and centuries roll by, with an ever-increasing population and an ever-increasing demand on our forests, we are directed by that invisible guiding hand that rules us to conserve our natural resources, to the end that we may maintain our supremacy as a nation and leave a rich heritage to the generations to come.

I do not believe in the idea of buying virgin forests and then prohibiting the removal of a ripe and mature crop. How many of you have ever stopped to think that you are partners, to the extent of the taxes you pay, in the 1,600,000 acres of state-owned lands? How many of you know that there are millions and millions of feet of matured trees on the state lands that are being allowed to rot annually? You also know that you would not allow a condition of this kind to exist in your own business. You also know you would harvest a mature crop with an eye to raising another. Is it not time you should demand that the State manage this vast property in your interests? For years our legislators have been accumulating this property and locking it up under a Constitution that prohibits even the use of a few twigs for a camp fire, to say nothing of deriving a revenue of millions of dollars from a maturing and ripe crop. Is it not time our Constitution should be amended in your interests and mine?

Do you know, ladies and gentlemen, that whenever I am called upon to speak on forestry conditions I feel as though I am a marked man, and am pointed at with suspicion as being purely selfish in what I am advocating? It is then that I wish I had no material interest in any forest lands.

The association of which I have the honor to be president has done more in the last few years to promote conservation in this State than all other agencies put together. It numbers among its members the largest owners of timberlands in the Adirondacks. We are each year urging our Legislature to provide more nurseries and to reforest more land. We are working hand in hand with all the associations and organizations interested in the protection and perpetuation of our forests. We believe the Constitution should be amended so as to permit the cutting of matured trees. This we have advocated for years, as we do not believe in any investment that will not yield some return. If the Constitution would permit of an income from these lands, I should advocate that every dollar of such income be expended in either clearing up our forests, planting trees, or purchasing more land.

When Article 7 of Section 7 of the Constitution was written, it must have complied with the demands of the time. We, however, are living in an age in which the changed conditions of civilization demand a change in the Constitution, and we must not ignore this demand. It says to us, our responsibilities for the generations to come are increasing year after year. It also says to us, our forests must be lumbered and cultivated, that they may be productive for centuries. It is here that the young man who elects to study forestry will find his principal work. Only the most improved methods of lumbering must be used, and it is here that the trained man will find employment.

It is but fair that I should ask the question, why have we been deprived of the use of the income from this property for so many years? There is but one answer. You and I—and by this I mean every one who casts a ballot—are afraid to trust our State Government to attempt to administer honestly any public charge, and in view of past history I am not quite sure but that our suspicions are well founded.

Our association has made a number of suggestions to prevent any political party from ever using our state lands to pay political debts. We have had in our forestry bills a clause providing that the management of our state lands should be in the hands of an advisory board, to act with the commissioner in charge of our forests, and this board to consist of a Judge of the Supreme Court, the Attorney-General, and a practical lumberman, or any other combination that would be absolutely free from all political entanglements.

Every suggestion of this kind has been met with opposition from the Conservation Commission. I cannot conceive why there should be objection here. Here is a property worth millions and millions of dollars, and the responsibility for its administration is so great that any suggestion to divide this responsibility should be welcomed by the whole Commission. Sooner or later the people will demand this very thing, and then we shall see an income to the State and the employment of many persons.

I should like to see every board of supervisors in every county in this State employ one or more graduates from a forestry school to study the waste-land conditions of the State. Then let every piece of waste land be reforested. This problem is so large and there are so many different phases to it that it is almost impossible to more than touch on a few points in a paper of this kind.

The subject assigned me was "Principal Lines of Effort in American Forestry for the Next Decade in Lumbering." As the result of association work, many of our members are now lumbering their properties under the most approved methods. This circle is gradually widening, but at times progress seems slow. The masses of the people need educating to the fact that trees must be grown and that they are as essential to our prosperity as is any other crop.

I have confined myself largely to our state problems, and have tried to show you, without giving a mass of figures, the value of the immense property in which we are all stockholders. I have tried to show you that any attempt to utilize the matured crop on this property must be safeguarded in every possible way. I have tried to show you that here is the real work of the trained forester. He is the man in whom you and I must place confidence that he will be honest in the lumbering of this vast property. We have seen many of the great problems undertaken by the State permeated with graft, but I am just optimistic enough to believe there are still some honest men left. I believe that within a few years our Conservation Commission will welcome the assistance that an advisory board can give them, and then we can look forward to practical conservation.

MAKING PUBLIC OPINION EFFECTIVE

BY HENRY S. DRINKER, SOUTH BETHLEHEM, PENNSYLVANIA

President, Lehigh University; President, American Forestry Association

Our country is undoubtedly primarily indebted to ex-President Roosevelt for having given, during his term of office, official and widespread publicity to the importance of the principles of conservation of our natural resources; and it is recognized that his attention was drawn to the subject by his friend Gifford Pinchot, then United States Forester. Undoubtedly it is to these two men that the country owes more than to any others the public awakening that has come during the last decade to this very important phase of national economy and care of property held both nationally and individually.

Probably the first professional utterance on the subject of conservation was the one made over forty years ago by the American Institute of Mining Engineers in the appointment, at the first session of the institute held at Wilkes-Barre, Pennsylvania, in 1871, of a committee of eminent mining engineers "To consider and report on the waste in coal mining." This was long before our statesmen had awakened to the importance of the conservation question, and in this matter, as in so many others of progress and enlightenment, we may well recognize that the initiative came from our men of scientific training who spread the light on the path that others follow. Earliest of those who preached and impressed in America the lessons of forest conservation was Dr. J. T. Rothrock, of Pennsylvania, who lectured on forestry in the Michaux Lecture Course of the University of Pennsylvania in 1877. We all know of and honor Doctor Fernow's early and pioneer teaching in forestry in America prior to his work here at Cornell, bringing as he did to America the teachings of one versed in the European experience and study, which reached high efficiency before our heedless people had begun to realize that the resources that seemed to them to be boundless had a limit. To-day we know that the advance of knowledge and interest in conservation has been so pronounced that it is recognized as a national question of importance to all our

people. The need of conservation is no longer seriously questioned, but there is much difference of opinion as to the methods to be pursued in putting into effect its teachings. But those methods, necessarily differing somewhat in adjustment to environment and local conditions, will adjust themselves. It is our duty not to rest satisfied with partial accomplishment, but to continue by widespread activity to insistently impress on our fellow citizens the need of intelligent, constant attention to this matter.

Our legislators will listen. They have listened to you here in New York, where you have the largest forest preserve of any State. They will listen to the preaching of you experts as to the proper and intelligent handling of those reserves, to the end that they may be made a country-wide object lesson of the practice of forestry for the benefit of the people, rather than a mere forest reserve for game protection. New York preceded Pennsylvania in the enactment of laws embodying the modern principle of tax legislation based on yield, though we Pennsylvanians claim that your State came to us for suggestions in the matter derived from the tax laws introduced by the Pennsylvania Forestry Association and offered to the Pennsylvania Legislature for six long years before your Legislature acted in 1911, and for eight years before the laws were finally adopted and passed in Pennsylvania in the winter of 1913. And now the advocates of conservation can feel that with the immense spread of publicity incident to the sessions of the National Conservation Congress, since the institution of the Congress (following the meeting and Conference on Conservation of the Governors of the States, called by President Roosevelt at Washington), the practical economic value of the study of conservation of our forests, minerals, and waters has been brought home to our people. The very intensity of the discussions, the insistence on differences of opinion—especially in the matter of the conservation and development of water power, which was so pronounced at the last Conservation Congress—was, and is of course, a prime feature in the campaign of publicity necessary to enlist the general interest of our people in these matters, and is proof positive that a large proportion of the thinking active people are already actively and intensely interested, and awake to the fact that these questions have become public property and that a proper policy for the development and care of our natural resources is no longer to be relegated to the few who presciently have the power to see their value, but to all men.

It is hard to do adequate justice to the value of the discussion on publicity embodied in the report of the committee formed under the auspices of the American Forestry Association and the Fifth National Conservation Congress. Mr. E. T. Allen, the chairman of that committee, is a past master of education of the public in forestry questions. The Western Forestry and Conservation Association, of which he is the Forester, has taught how to bring home to our people in readable and attractive form, by posters and pamphlets, the dire lessons of loss from forest fire and waste; and the spread of this system of teaching and publicity from the virile West throughout the conservative East has shown what can be done.

It is not the high-browed, scholastically matured, and cultured citizen who should be reached and taught. The West has shown us that we should go to the children and to the masses of our people, by appeals that are insistent in their plain speech and lurid illustration in impressing the lessons of personal loss that come from neglect of the principles of conservation. For those who are interested in spreading these lessons, no better textbook can be had than the above report of the

Committee on Publicity of the last Conservation Congress. It should be read and widely studied by the conservationists and foresters of the country, in its discussion of the four leading topics of: (1) Publicity at the meetings of popular and technical organizations; (2) Publicity of the forestry work of the Conservation Congress, both of the general Congress and of the Forestry Committee; (3) Publicity through the press, looking particularly to the arousing of public interest in fire protection, taxation, and state forestry; (4) Publicity methods and devices useful to fire associations and other forest protective agencies.

And we should all carefully remember the conclusions reached by this able committee, as follows:

1. Progress in forestry depends more on what the public will permit than on foresters and lumbermen. Consequently, public education is of primary importance.

2. Education is a matter of publicity, and publicity is a trade in itself. It cannot be practiced intuitively.

3. Since no one else has the interest or the requisite forestry knowledge, foresters and lumbermen must learn this trade.

4. It is not forests, but the use of forests, that we seek to perpetuate. Therefore, to be sound and convincing, educational publicity must include the lumber business. So long as the public believes forestry good and lumbering bad, there will be confusion and no real progress.

Now, granted that public opinion has been measurably aroused to the importance of the promotion of the conservation of our natural resources, how are we to make it effective? What should we do to this end?

It seems to me that the report of the Forestry Committee above referred to covers this ground so exhaustively that, while the repetition of its suggestions might count for emphasis, such repetition is not called for here in this assemblage of foresters. What is now needed is that we all take these lessons to heart, and that we individually and unitedly pursue the duty of bringing home to our fellow citizens the lessons of conservation.

While it is highly beneficial for foresters to meet and take counsel, confer, and exchange views, as is being done at this meeting, we should remember that these meetings of experts are not the missionary meetings that spread the cause. We should go out *in partibus infidelium*. Cornell is one of the great homes of forestry. Here you know the things that elsewhere should be taught. For instance, the American Forestry Association has arranged to hold its summer session this year at Chautauqua, New York. Two days of that great assemblage of thousands of our fellow citizens are to be given to the discussion of conservation, and primarily of forestry. There, and in similar meetings, we should reach the people who gather for the express purpose of education and improvement, who are receptive to lessons looking to patriotic effort and national needs—people largely lacking the advantage and experience of college or university training, but who nevertheless represent, and are members of, that large body of intelligent, reading American citizens who are keen for intellectual advancement and potent by their numbers in the formation and sway of public opinion.

If the doctrine of conservation that we preach is right—and we believe it is—it is our duty to spread it far and wide. *Magna est veritas, et prævalet*—Great is truth, and mighty above all things; but its victory will be distant or near, in proportion as its disciples labor for its success and carry its light through the length and breadth of our land.

PROBLEMS OF FORESTRY IN NEW YORK STATE

BY J. S. WHIPPLE, SALAMANCA, NEW YORK

President, New York State Forestry Association

The principal lines of effort in American forestry in New York State are as follows:

1. That, so far as the statutes control and the State has management, forestry work should be placed in charge of a separate department, with one commissioner at its head and with a capable, trained forester as superintendent, assisted by such other trained foresters as may be necessary; and the management should be kept out of politics.

2. A better understanding among the people of what forestry means.

3. More tree gardens, both public and private, and forest planting on a much larger scale generally throughout the State. Each municipality should plant all vacant places on its watershed.

4. On the state lands there should be a careful examination and record made of the location, extent, and value of camp sites.

5. There should be an accurate and careful appraisalment of state lands outside of the park lines.

6. The constitution should be changed to permit the sale of detached parcels of the state lands outside of the parks where that is desirable, except at Lake George and in the near vicinity, and also to permit the leasing of camp sites within the state reserves.

7. The change of the Constitution should also permit the conducting of conservative lumbering on the lands that should be lumbered, and the building of necessary roads.

8. The profits from lumbering on state land, where lumbering should be done, should be used to increase the State's holdings in the parks, for better fire protection, and for reforestation denuded lands.

9. The tax law should be changed and made liberal enough to permit owners of timbered lands to hold the timber and conduct cutting operations in a scientific manner, under the best modern methods, for continued reproduction, and to induce all owners of land suitable for tree production to plant commercial forests.

10. We should have a state-wide forest fire service under laws giving the State Department power to create fire districts in forested sections of the State where necessary, to build observation stations and equip them with telephones, and to establish a fire patrol anywhere in the State where needed.

11. State lands within the "Blue Line" should be inventoried and classified at least in two classes: A, where lumbering should be done; B, where lumbering should not be done, as on mountain tops.

12. Instruction in the A B C's of forestry and in the value and uses of trees should be given in every school. The Boy Scouts and the boys in every school should be encouraged to plant a considerable number of commercial trees each year on lands owned by the town, city, or village. Towns, villages, and cities should acquire lands suitable for the work and dedicate them to that purpose. This should result in the planting of thirty million trees each year, which means three hundred million planted in ten years by this way alone.

13. The State should appropriate more money for the purchase of small tracts of common land outside of the "Blue Line" throughout the State, in slightly locations. The State should then cause such lands to be planted, as object lessons. The State has too long neglected real, organized effort in the direction of better general knowledge, more and broader work, in this field of most important endeavor. No subject, no public enterprise, is of greater importance to the present and future generations of the people.

14. In order that all this may be quickly accomplished, public opinion must be more rapidly developed along right lines. With that object in view, and among other things, the State Forestry Association should be built up by procuring a membership of at least ten thousand men and women of the best type, who will spend some money and do much work without pay, prompted by their public spirit and patriotism. They could do much to create public opinion. Branch forestry organizations should be established in every city, village, and town in the State, foresters should be employed in all these places, shade trees protected, more shade trees planted, and barren acres everywhere planted with commercial trees. These are the principal lines of effort in forestry for the State of New York for the next ten years at least.

I have just noticed the following statement, issued by a school of forestry: "For the next decade in this country, lumbering and wood utilization will be more important phases of forestry than reforestation or the production of the forest."

Personally I cannot agree with that doctrine. It seems to me that just now, and for the next ten to twenty years, there is nothing more important than getting a wood supply for the future started. It takes many years for trees to grow to a profitable cutting size. Long before we get a reasonable amount of trees started from which our future wood supply must come, we shall have little or no timber to cut that is suitable for lumber. To-day there are many more men who are interested in and know about cutting and manufacturing lumber than there are interested in and knowing much about planting and growing a new forest. We need education along the latter line.

The following are some of the reasons why these things should be done: Our forests are being rapidly removed and consumed. The natural reproduction is not one fifth fast enough and is of poor quality. Many of the best and most valuable specimens of trees are not reproducing at all. The reason why the cone-bearing tree does not reproduce itself is that few seeds ever reach mineral soil, even where there are any such trees left. Then, too, many of the seeds are eaten by birds, mice, squirrels, and insects. If we are to keep the cone-bearing tree in commercial quantities, we must plant the trees.

In many places trees are much more valuable for protection to water supply, the soil, the farm, the healthfulness of the country, for a home and a breeding place for wild life—birds and animals—for windbreaks, for recreation parks, and for many other purposes, than they are for lumber. In fact, oftentimes, a country made destitute of trees becomes worthless and uninhabitable. The very life and usefulness of a country sometimes depends on a reasonable amount of forest-covered land. At least one fourth of every country should be covered with trees. Furthermore, they should be good trees, not scrubs. The only way is to plant and care for them, as you would with any other crop.

We need only to look about us a little in order to understand the importance of trees, especially in all the hilly portions of our country. We must have clean, fertile farms; we must have plenty of constantly running water; we ought to have recreation park lands, fish, and game; we must have wood for a thousand purposes. In order to have all these necessary things, we must have a large amount of forest-covered land. The history of the world has proved this fact. Forests are especially necessary in a rolling country, because they protect and conserve the water supply. One has only to visit northern China, or some other one of the old countries that has suffered because of the wanton destruction of its forests, in order to understand that. In fact, one need not visit any one of them; he may read their histories and become convinced.

Ordinarily it would seem not necessary to go into details with so highly and specially educated an audience as this; but fearing that one, at least, has forgotten or failed to understand nature's plan of water storage and supply, let us again examine nature's reservoir.

Nature is a wonderfully fine mechanical engineer. Man at his best has never equaled nature in this respect. Nature's reservoir is constructed in this fashion: The trees are the greatest factor. Every leaf on every tree is part of nature's reservoir; everything that catches and holds back a drop of water, if only for an instant, is a part of it. Every root running down into the ground, of all the billions of roots, is a part of it; every limb of every tree, the tree itself, are parts of it—the water follows the roots down into the soil and the rock crevices; all the old limbs, old logs, leaves, and debris on the ground are parts of it. Between every two trees there is a hollow, or basin, in the ground, which catches and holds the water and allows it to soak into the earth; and these, too, are parts of nature's reservoir. Then, too, there is the humus, formed from decayed vegetable matter, which has wonderful properties to take up and hold water like a sponge; this humus covers all the ground under the trees from an inch to two feet thick, and is a very important part of nature's reservoir. All these things constitute the greatest and most wonderful reservoir in the world. They hold back the water, allow it to penetrate down deep into the earth and among the rocks, to feed the little springs on the mountain's side. The springs feed the little brooks, the little brooks feed the larger ones, and they the rivers; and in this way the water is supplied and kept running all the year round. The proof of this is at hand. When the forest is all removed on a great watershed, the trees, the limbs, the leaves are gone, the stumps rot out, the debris and the humus are burned up, the hollows are leveled down, and all the elements that formed the reservoir and held back the water are swept away and destroyed. When storms come, the water runs from the hillside nearly as readily as from the roof of the house; the creeks are swollen torrents; the rivers overflow their banks and are destructive demons, leaving ruin in their paths, with silt, gravel, and wreckage scattered over the lowlands. Then the drought period comes, and all the once-murmuring forest streams are dry creeks, and there is no water.

This alone is reason enough for maintaining on all the poorer lands a good growth of forest trees.

Yet there are many other reasons why my fourteen stated propositions are necessary and true. Of all our national resources, the forests have been, are now and always will be, the most necessary and valuable. On the forests more

depends than on any other one natural resource. The fortunate part is that, of all resources, this one is the most easily replenished and supplied.

Until lately, all our people, in the destruction and want of care of our forests, have been acting like a drunken sailor who has come into the possession of an unexpected property. We seem to be in a wild scramble to dissipate our inheritance. We have chopped down and burned it on the ground; we have slaughtered it and taken only the best logs; we have neglected it and allowed it to burn up; we have cut the last seed tree of conifers in most places, and thereby prevented reseeded and reproduction, even the little that nature will supply. We have cut the undersized trees these latter years, and have lost the new growth at the very time when it would grow the fastest, and thereby have prevented and lost the opportunity of a continuing forest. We have denuded millions of acres of land that can produce nothing of value except trees, and that should always grow trees but have no chance. Nowhere have we cared for the new growth, or given it a chance by culling out the worthless material.

We have seen the price of lumber rise from ten to eighty dollars a thousand, the forests diminish, floods increase, hillsides erode, farms in the lowlands covered with debris, and dry river beds in July, August, and September; yet the cutting and waste has gone on, and little or no effort has been made to stay the destruction or to replenish the forests. Truly here is work for men with patriotism, for seeing men, students, teachers, and statesmen.

THE FOREST

BY L. H. BAILEY, ITHACA, NEW YORK

Former Director, New York State College of Agriculture

(An abstract of the address)

"This is the forest primeval." These are the significant words of the poet in "Evangeline." Perhaps more than any single utterance they have set the American youth against the background of the forest. In many respects they are the first and the best, and also among the most forceful, words in American forestry.

The backgrounds are important. The life of every one of us is relative. We miss our destiny when we miss or forget our backgrounds. We lose ourselves. Men go off in vague heresies when they forget the conditions against which they live. Judgments become too refined and men tend to become merely argumentative.

The backgrounds are the great unoccupied spaces. They are the large environments in which we live but which we do not make. The backgrounds are the sky with its limitless reaches; the silences of the sea; the tundra in pallid arctic nights; the deserts with their prismatic colors; the shores that gird the planet; the vast mountains that are beyond reach; the winds, which are the universal voice in nature; the sacredness of the night; the elemental simplicity of the open fields; and the solitude of the forest. These are the facts and situations against which we set our lives, to which we adjust our civilization, and by which we measure ourselves.

The great conquest of mankind is the conquest of his natural conditions. When a man conquers these conditions he also conquers himself. We admire

the man who overcomes: the sailor or navigator in hostile and unknown seas; the engineer who projects himself hard against the obstacles; the farmer who ameliorates the earth to man's use. Men have expressed their energy for conquest in military operations. When we begin to see the end of war, we shall expend ourselves more unreservedly and more joyfully in the victory over the earth. It is a great lesson that we are teaching men, in using the War Department to build a canal to connect the two oceans.

But even though we conquer or modify the physical conditions against which we are set, nevertheless the backgrounds will remain. I hope that we may always say "the forest primeval." I hope that some reaches of the sea may never be sailed, that some swamps may never be drained, that some mountain peaks may never be scaled, that some forests may never be harvested. I hope that some knowledge may never be revealed.

Look at your map of the globe. Note how few the areas of great congestion of population and of much human activity as compared with the vast and apparently empty spaces. How small are the spots that represent the cities, and what a little part of the earth are the political divisions that are most in the minds of men! We are likely to think that all these outlying and thinly peopled places are the wastes. I suspect that they contribute more to the race than we think. I am glad that there are still some places of mystery, some reaches of hope, some things far beyond us, some spaces to conjure up dreams. I am glad that all the earth is not Iowa. I am glad that some of it is the hard hills of New England, some the heathered heights of Scotland, some the cold distances of Quebec, some the islands far off in little traversed seas, and some also the unexplored domains that lie within eyesight of our own homes. It is well to know that these spaces exist, that there are places of escape. They add much to the ambition of the race; they make for strength, for courage, and for renewal.

In the cities I am always interested in the variety of the contents of the store windows. Various fabricated and disguised, these materials come from the ends of the earth. They come from the shores of the seas, from the mines, from the land, from the forests, from the arctic, and from the tropics. They are from the backgrounds. The cities are great, but how much greater are the forest and the sea!

No people should be forbidden the influence of the forest. No child should grow up without a knowledge of the forest; and I mean a real forest and not a grove or village trees or a park. There are no forests in cities, however many trees there may be. As a city is much more than a collection of houses, so is a forest much more than a collection of trees. The forest has its own round of life, its characteristic attributes, its climate, and its inhabitants. When you enter a real forest you enter the solitudes, you are in the unguessed distances. You walk on the mold of years, and perhaps of ages. There is no other wind like the wind of the forest; there is no other odor like the odor of the forest; there is no solitude more complete; there is no other song of a brook like the song of a forest brook; there is no other call of a bird like that of a forest bird; there are no other mysteries that are so deep and that seem yet to be within one's realization.

While a forest is more than trees, yet the trees are the essential part of the forest; and no one ever really knows or understands a forest until he first understands a tree. There is no thing in nature finer and stronger than the bark of a

tree; it is a thing in place, adapted to its ends, perfect in its conformation, beautiful in its color and its form and the sweep of its contour; and every bark is peculiar to its species. I think that one never really likes a tree until he is impelled to embrace it with his arms and to run his fingers through the grooves of its bark.

Man listens in the forest. He pauses in the forest. He finds himself. He loses himself in the town, and even perhaps in the university. He may lose himself in business and in great affairs; but in the forest he is one with a tree, he stands by himself and yet with consolation, and he comes back to his own place in the scheme of things. We have almost forgotten to listen; so great and ceaseless is the racket that the little voices pass over our ears and we hear them not. I have asked person after person whether he knew the song of the chipping sparrow, and most persons are unaware that it has any song. We do not hear it in the blare of the city street, when we ride in an automobile, or when we are in a thunderous crowd. We hear it in the still places and when our ears are ready to catch the smaller sounds. There is no other music like the music of the forest, and the better part of it is faint and far away or high in the tree tops.

The forest may be a sanctuary. "The groves were God's first temples." We need all our churches, and more, but we need also the sanctuary of the forest. It is a poor people that has no forests. I prize the farms because they have forests. It is a poor political philosophy that has no forests. It is a poor nation that has no forests and no workers in wood.

In this State, and in all States, and in the provinces, there are forests. I think that we do not get the most out of them. Certainly they have two uses—one for the products, and one for the human relief and the inspiration. I should like to see a movement looking toward the better utilization of the forests humanly, as we use school buildings and church buildings and public halls. I wish that we might take our friends to the forests as we also take them to see the works of the masters. For this purpose, we should not go in large groups. We need sympathetic guidance. Parties of two and four may go separately to the forests to walk and to sit and to be silent. I would not forget the forest in the night, in the silence and the simplicity of the darkness. Strangely few are the people who know a real forest at dark. Few are those who know the forest when the rain is falling or when the snow covers the earth. Yet the forest is as real in all these moments as when the sun is at full and the weather is fair.

I wish that we might know the forest intimately and sensitively as a part of our background. I think it would do much to keep us close to the verities and the essentials.

THE NATIONAL MOVEMENT FOR CONSERVATION

BY GIFFORD PINCHOT, MILFORD, PENNSYLVANIA

President, National Conservation Association

(An abstract of the address)

It causes me very deep pleasure to meet with you to-night to celebrate the opening of the Forestry Building at Cornell. The old school did good work and I have not the slightest doubt that you are going to do equally good work in the future here now, and I am proud and glad to be with you on this occasion.

Now let me go straight into the subject that has been assigned to me. I am to speak on some of the main articles of the conservation program; but before I take up two or three of the biggest things I want to say a word on what conservation is, what it has done, and what it has to do for the future.

As far as the fundamental side is concerned, it deals with the earth itself and the use of the earth for the greatest good to the greatest number for the longest time. It is the bottom policy, and we can go no farther back. That policy grew out of the forest policy, which impressed on the people of the United States the fundamental idea of conservation of their natural resources. The only remarkable thing is that conservation was born as late as it was. The thing is so natural, so obvious, it ought to have been created long before it was. It did grow, as I have said, directly out of the forest policy, and it was, so to speak, put on the map by what has seemed to me to be one of the most important things in history, when there were gathered in Washington in 1908 all the governors of the States.

They had two things to consider, the resources of the country and how to preserve them. Conservation has come to mean more. But at that time the question was whether there was enough within the ship of state in which they live, within the four walls of our boundaries—the Atlantic, the Pacific, Canada, and Mexico—to maintain a vigorous national life. The problem, then, that confronted the future was that we did not have enough to continue our average for very long; and then came the demand for an inventory of what we had, the first inventory ever made of the natural resources of any country in the world. The resources of the Federal Government were laid open for that purpose, and the work was completed in six months. Then came a most significant meeting; a group of ten men chosen from the United States, Mexico, and Canada in 1909 came together in Washington, making it evident that conservation of resources was not bounded by natural lines within the United States, and that it was to the interest of all North Americans to join together and decide how the resources might be used for the best interests of all. They in turn invited the President of the United States to lay before the nations of the world a plan for a world-wide conference that would bring together and prepare a method for the ascertainment of the natural resources of the whole globe, at least along the physical and economic lines. This laid the basis for a wise, intelligent, and foresighted use of natural resources for the people of the whole earth, and thereby would create the strongest and most effective bond for peace and good fellowship among the nations.

Unfortunately, the suggestion was dropped in the change of administration, and that meeting has not been held; but it will be held, and through this service will come a stronger movement for world peace and a world congress, in my judgment, than has come from any other movement. So conservation deals as far as it can with a new point of view on the continent, and will give us a new point of view in the whole world.

First, as this question of conservation arose, it dealt mostly, as I have indicated, with the natural resources in the country at present, their quantity, the waste that was going on, and the proper methods of avoiding that waste. It was purely a question of how much food and water and merchandise there was on board the ship, and we had not come to realize the question how that has been wasted.

The question of development and preservation and the use, broadly speaking, of natural resources had been considered. As to the numbers of our population which would be interested in that use, nothing had been said, but that point of view was not long in arising. Out of conservation—the efficient use of all the natural resources—as the idea was driven home to the minds of the people of the United States, naturally must come efficiency.

The second question was, for whose benefit shall the natural resources be used? And the way that came about was this: First, after the governors' conference had formulated the conservation idea, every one was for the conservation and there was practically no dissenting voice. Of course it was a good thing to use our natural resources wisely; but the moment we began to apply the idea, immediately opposition arose. Just exactly as in church so easy it is to apply the sermon to some one else, just so it is easy for the man who is doing things to have his neighbor be good, but when it is applied to his case opposition is instantly met. As we applied the conservation idea to, say, Mr. A and Mr. B, and said, "Your forests ought to be conserved, you ought to stop stealing timber, oil, and coal, you must grab no water power," then instantly a general protest began to be made with loud and vigorous opposition; and that has grown steadily, until now it is being overthrown and overwhelmed by the active support of the general body of the people. So, by the very force of circumstances, the conservation policy had to be a fighting policy, because it was a thing that was standing in the way of individual gain.

Immediately it became apparent that the case in which conservation could be easily applied, and with the best results, was these natural resources that still remain in the public hands, the natural resources of the present and the future; and the other question was the immediate use and preservation of any resources, first for the people in our times, and second for the people coming in the future. In other words, we had come squarely against the great question of private monopoly. Then it appeared that the conservation of natural resources works back on the average man and woman in the cost of living. In other words, it was realized that the real significance of the passage into private hands of great coal lands, timberlands, water power, of agricultural lands, of natural resources of any kind, affects the cost of living of the average man and woman.

We had, then, these situations to face: these great concentrations had taken place, they existed, new concentrations were constantly being made, and the first task, the important task, the task that could not be put off, was to stop further concentration. So the conservation policy became at once anti-monopoly—the fighting policy, as I have said, and the policy laid down from the point of view of the future to exceed the broad question of the present. It goes without saying that the natural resources are raw material, food, clothing, and household goods, and that the concentrated ownership of them causes power over all these comforts, conveniences, and utilities. It is always difficult in a great question of this kind, it is always difficult in any work that is worth doing, to keep clear before the mind the great object that lies behind it all and makes the whole thing worth while; and yet there is nothing better worth while than to keep the legitimate end before us. That is what has been done to some extent in conservation, and that is what is being done in the four big things before us along these lines.

The most important of these, to my mind, is the question of water power. I know of nothing bigger than the height to which material civilization has gone with the use of mechanical power. We in this country have actively and effectively before us at all times the capacity of 360,000,000 people, although we have only 100,000,000 men, women, and children of all ages. The control of that power puts into the hands of those who own it a more important influence over the daily life of all the remainder than any other form of control can give. As an illustration of this, it may be said that the average family in the United States has an income of about \$600, and of that \$600 more than \$150 goes to buy the cost of transportation in one way or another; of course that is a general average. Transportation means power. The water-power question is the question of the one natural power, the cheapest, most effective, of all the power with which we are acquainted.

There are, however, running through a policy that should be applied to all these kinds of power, certain main lines in which they are all alike. Water power, being a preferred sort of power and being essential to the general welfare, should not be allowed to pass out of the public control, whether owned by the State or by the nation; and the essential thing, first of all, is that every water power now held in the public hands should remain in the public hands. But in our form of organization it is improper to have those powers developed by the nation or by the State. Therefore they must be turned over temporarily to private individuals, and, through conferences with water-power men, the water-power policy has been threshed out. The Forest Service was six or seven years ahead of the other national departments. It has these main lines under which it ought to work: First, no power should be given away; but it should be leased for only a limited time in order to allow for the profitable development of power, because private enterprise will not take up water power unless it can make a profit. It simply must have development. Second, there must be compensation to the people. Do you realize that Niagara, the most valuable water power in the world, pays not one cent to the United States or to New York State? The men who have it now for ninety-nine years paid not one cent to the United States or to New York State for the valuable right. A time limit of fifty years permits development of the power, and no man should be allowed to develop just that part of it which might make him the most profit and get cheaper power from the people.

Behind the water-power policy lies the idea of ultimate public control. Take, for the next illustration, our grazing lands. Through the entire Western part of the country, not less than 350,000,000 acres are available for nothing except grazing. It is carrying now less than half what it might easily carry. That is to be put under public control. Always we should continue public ownership until homes can be made on the land. As long as that grazing land is producing but half, it follows at once that the price of meat all over this land is directly affected by this conservation policy, especially because any manufacturing line is affected by the water-power policy.

There is a proposition in the State of New York of developing water power in the Adirondacks. I am not sufficiently familiar with the details of the plan, but I am confident that the result over the nation will be that States and municipalities will take this and use it, not for the making of a profit for a few, but to spread the benefits as wisely as they can.

Take the question of our coal, oil, and natural gas, in addition to water power. Not one acre of any of these public lands containing coal or oil or natural gas ought to be allowed to pass out of the control of the State or nation where it is owned now. Public control over these things makes possible control over the life of the people. There are bills in Congress now for handling water power wisely, for leasing the public lands, keeping the right of control in the Government's hands but leasing to private individuals and getting the lands into general use.

There is a bill for handling the grazing lands in the same way, and there has just been passed a bill to start what will be probably, before we finish working it out, the most complete and satisfactory conservation to be found outside the national forests; that is to say, a bill has been passed for the construction of a government railroad in Alaska. A government railroad in Alaska means very little unless it is followed out by the use of its resources, especially coal, in order to prevent their control and concentration in a few hands and giving them power to dictate the price of things that all of us must have. That is the essence of the conservation policy—the use of all these resources for all the people. The distinction is as clear to you as it is to me.

The policy also takes measures to acquaint the people of the United States with conservation. To-day the essential of conservation is to further prevent destruction, as this makes the article that is destroyed high in price to the average buyer. It must also take measures to prevent the monopoly of natural resources. Third, and that is the part that still remains to the future, it must provide for the handling of the concentrations that have already taken place.

You will note I have said nothing at all about the forests. You have heard that to-day, and I do not intend to repeat. I do want to use one illustration that has arisen, which is the next but one step to the conservation movement—the matter of handling the concentrations that have already taken place.

There are in the hands of one group of Western lumbermen thousands of acres of public timber, passed into private hands partly because of the bad administration and partly because the laws were bad. For less than a tenth of what that timber was worth it has passed into the hands of a small group of men from the people of the United States—a property worth, in round numbers, nine hundred million dollars.

It is the same way with water power. Sixty-five per cent of the developed water power is in ten companies or ten groups of companies, and they also control undeveloped water power; so that there is not only an enormous increase in the power developed, but still more rapid increase in the water power held for development in the future. The groundwork is laid for a giant monopoly, a greater control than in any other country. Eighty per cent of the anthracite coal is in the hands of one group or company, so that about forty men have in their power the domination over the use and price of this public necessity over a large part of the United States. Sixteen hundred and forty-one men, owners or group owners, own one out of every twenty acres in the United States, and there is a concentration of oil, lead, and all other natural resources, about which I need not speak at present.

What should we do about it? All of us have shied this question—partly for good reasons—of how to prevent the further concentration of these resources. We have not been willing to face the question of what shall be done with the resources already concentrated, but that must be faced in the very near future.

I shall not attempt to make any solution, but merely say there are certain lines along which it has been proposed that this question shall be taken. Perhaps the most difficult of the questions to be faced will be that of the unearned increment that people are required to pay and that they will be paying into the hands of private owners to whom they gave their resources. It has been proposed to meet the question by taxation, and the most earnest among these single-tax advocates will find it necessary to vary the straight single tax. The theory of expropriation may be advanced so that the State will say, we will take for the public use what we gave out of the public treasury. The theory of control that the State and the nation should exercise over the owners of these resources would mean the taking for the public of a given interest on what was their property and must be used for the public welfare. These are not all the solutions, but it is enough to bring the matter before you.

The great question in the next generation is, what shall be done to remedy the conditions that we have allowed to take place? What must we do to prevent the further aggravation of these conditions? It is perfectly clear to me—at least in the nature of certain natural resources, possibly very limited in number but very important in character—that the solution will be public ownership, or such public control as will amount to giving the people of the country and the State the benefit of public ownership.

I have run very rapidly over some of the questions that you might or might not expect to be included within my subject, and I have left entirely to one side many of the questions that most usually fall within the name of conservation.

There are certain questions that Mr. Greeley discussed about government ownership. These are questions, at least for the present, involving controversy, which are immediately assailed—fighting questions—and this is the fighting aspect of the conservation policy. Before such an audience as this I need say nothing, or make but brief reference to the evident welfare of this whole nation. That you understand as well as I.

I want to say in closing just this one thing: there is no task which might possibly rest on any man or woman that is equal in binding power to the task of leaving the country for our descendants as good as it has been for us.

In South Carolina, where I had charge of forest lands, I remember going by on such a road and seeing a little enclosure with a tombstone, and I looked over and read; I will say the name was John Smith. It read, "John Smith, born 1821, died 1895," and under it just this one line, "He left this country better than he found it." I do not think for one, that any finer epitaph can ever be written than that.

Conservation means that, if it means anything; it means it not only for the present, but for the future as well. Conservation is tremendously interested in the present. We have first learned of the natural resources of our lands, but there is to be built on this continent of North America a better system, a more direct and efficient application of laws governing the natural resources and the welfare of all the people of the land. Conservation is the building policy, it is the civilization-building policy, it is the use of the earth for the benefit of all the people; and to them it ought to mean, and to some it does mean, a better people living in a better land and nation. All that there is, and the best that there is, should be used to benefit all the people in the land; that is what conservationists are fighting for. I know of no better or finer task.

PART II

PROCEEDINGS AT THE
OPEN MEETING OF THE
SOCIETY OF AMERICAN FORESTERS
ITHACA, NEW YORK
MAY 16, 1914

PROGRAM
OPEN MEETING OF THE SOCIETY OF AMERICAN
FORESTERS

ITHACA, NEW YORK

SATURDAY, MAY 16, 1914

Chairman—B. E. FERNOW, President of the Society.

Principal Lines of Effort in American Forestry for the Next Decade

In State Forestry—The East

ALFRED GASKILL, Trenton, New Jersey; State Forester of New Jersey

In State Forestry—The Middle West

FILIBERT ROTH, Ann Arbor, Michigan; Director, Department of Forestry,
University of Michigan

In the Society of American Foresters—

B. E. FERNOW, Toronto, Ontario; President, Society of American Foresters

THE NEXT TEN YEARS IN EASTERN FORESTRY

BY ALFRED GASKILL, TRENTON, NEW JERSEY

State Forester of New Jersey

The natural approach to this inquiry clearly is by the way of an effort to value what has already been done in the East; especially to determine wherein the work of the past two decades has been along constructive lines, and hence permanently successful, and wherein it represents mainly enthusiasm directed by more or less intelligence.

It goes without saying that the needs of the East, and therefore the particular lines of effort to be followed, are in no sense different from those of other sections, except in the important respects that the East contains the bulk of the population and has developed more fully its necessities as well as its resources. To my mind, assurance that the territory east of the Mississippi River is bound to carry the weight of the nation marks it as that in which forestry must soon get on an intensive basis. As virgin supplies, distant as well as near, are exhausted, local needs will be intensified and opportunity to develop home forests will come. Here and there, as in the North Woods, considerable areas of forest may remain intact and give opportunity for lumbering operations of magnitude; but in the main we shall have to deal with small units, intensive methods, and local markets. The forest stores of the South and the West are not likely to give us a free field within ten years, and after the South and the West may come South America—but all those are far off. Our forests, and therefore our opportunity, are where the people are.

My first suggestion is that we strive to size up the situation in each community and establish a policy that will serve its immediate and peculiar needs. If this leads to woodlot management pure and simple, let woodlot development be the aim. If it leads by way of shade tree and park interests, so much the better, for they need intelligent direction. Imitation is to be avoided unless identical conditions are offered. In respect to authority and example, one may well inquire whether we have not drawn too exclusively on middle Europe. In so far as I know them, the practices of England and France are as worthy of study as those of Germany and Austria. The reproach under which our English friends rest is, not that they have failed to suit their forestry to home conditions, but that they have done so little of it.

As a second point, I venture to suggest that forestry and foresters in the United States—and this means chiefly the East—have not been so uniformly, or so completely, successful as we like to think. In the language of mechanics, our machine has raced a bit now and then through excess of power and deficient control. That this should be so is doubtless inevitable from the fact that the work was new and the workers were inexperienced. It is altogether probable that the future will measure the accomplishment of the nation up to this time as far beyond what could have been expected; nevertheless, progress in the future will be less easy. We must invite sharp criticism and severe judgments; must be prepared to prove, not merely to assert, the reasonableness of a position. The time has come, I think, to take a positive stand against making and remaking studies, catalogues, and reports. One prominent woodlot demonstration, one practical plantation, one important economy in utilization, one township freed

of fire, is worth a dozen such studies or reports. It is probably true that the Cause of Forestry can still be spelled with capitals; that is, that it has elements of the propaganda, yet can justify no departure from strict accuracy and a careful estimation of the real value of each movement.

"If there's a hole in a' your coats,
I rede you tent it:
A chield's amang you taking notes,
and, faith, he'll prent it."

Whatever effort is made must be carried to an effective conclusion. We all know how futile has been the result of most of the advice and recommendations that have been given. Incompleted projects strew our path. That they are not yet great enough nor many enough to bar progress is our good fortune; their multiplication will surely have that effect.

It is safe to assume that for some years most of the effort in the East will be directed, if not controlled, by state officials. You will agree that the vital factor in every instance is a man. To find, install, and support a capable forester in each State is essential. The effort should not be limited to state lines, for often a forester can do no better service than yield a valued assistant who is wanted in another field. Some skill as a forester can be sacrificed, during the formative period, to ability as a popular educator, and later to executive strength. This because it is more important, as it is more difficult, to manage forest owners than it is to manage forests. Fortunately, this requirement is being met in one State after another. The difficulties that arise through politics are not to be avoided. I know of nothing but character and patience that will overcome them.

Next in order is to consider the future forests rather than those that now exist. Not a few persons have reached the conclusion that one of our most serious mistakes has been in directing so much attention toward the exploitation of virgin stands. In the nature of things, it was, and is, inevitable that such stores should be rapidly utilized and of course largely wasted. The instruction that foresters have offered the lumbermen probably has done good, it certainly has been taken in good part; nevertheless, how many lumbermen have done anything for any forest beyond seeking to preserve the present stand until the loggers can get to it? I find no fault with lumbermen. In their places any of us would do the same. We should always hold them our necessary helpers. My inquiry at this point simply is, are not the landowners who may have timber to sell, the multitude of woodlot owners in many sections, the seekers after long-time investments in others, more likely to be our supporters than the lumbermen? Not in our time will the demand for "cheap logs" be satisfied by a promise of more trees sometime. Of course the two interests may be combined; where they are, the forester naturally has a place. This view loses no significance beside the growing disposition to regard the forester's and the lumberman's fields as quite distinct, though complementary.

An important line of effort is suggested by the foregoing, and by recollections of much wasted energy. It is to clear the natural channels and give forestry a fair chance. Have we not tried hard enough and long enough to induce timber owners to work for a sustained yield in the face of the fact that even a second cut could not be shown to be profitable? Have not forests been planted in advance of the establishment of fire protection? Have we not advocated intensive

silviculture in regions where there are no markets and no highways? I may be wrong, but my idea is that we can work more than we have worked along lines of low resistance, that we can take a lesson from the riverman and, by a little digging here, a little blasting there, harness natural forces to our will. The means to this end are security through fire control, easy transportation, the development of near-by markets. To my mind these problems must be worked out long in advance for any specific woods—tasks relatively simple.

And now we touch the question of private forestry. Governments may tackle the problem and solve it in a wisely paternal way, though I doubt whether many States are ready, or able, to buy up enough forest to make a real impression. Each, therefore, must determine, definitely and soon, whether it will advocate chiefly state forestry, as New York and Pennsylvania do, or private forestry, as is done in New Jersey and Connecticut. The importance of this point lies in the fact that the two policies are in a sense antagonistic. That is, if state forestry is strongly supported it necessarily weakens the effort to induce private owners to invest money in timberlands. Has not New York, for instance, been blinded by her forest preserve to the existence of other and more valuable forests—her woodlots? I do not venture to say what policy is right, though it is not difficult to conclude that forestry is a job for the landowner, whoever he may be; nor that, for our generation at least, the owner is more likely to be an individual or a corporation, than the government. Perhaps the answer to the query will be found after both policies have been tested. We shall agree that there must be demonstration forests, and that any remnants of public lands should remain under state control.

Lastly, though it might well stand first, is the importance of establishing the fact that forestry is a highly complex art. Of course we have all repudiated the common notion that tree planting is its beginning and end. My thought is that we shall advance the more surely, the better we are able to show that our aims comprehend a complete order of economic and social, as well as silvical, adjustment. I do not pretend to say that something must not be yielded to expediency, or to the wishes of powerful friends. I do believe that the more firmly a forester holds to his faith, the more steadfastly he insists on a true proportion and strives to build on a sure and broad foundation, the greater will be his actual accomplishment.

You may have expected me to say something about fire control, economic utilization, taxation. The first is unquestionably an absolute prerequisite to successful forestry anywhere, and the most vital question at the moment; but it is also a local problem that must be worked out by each State for itself. Fortunately there is a large volume of experience available to every worker. The chief thing to guard against is over-confidence. Fire protection breeds fires by increasing the brushwood area, and the first successes mark only the beginning of a task the completion of which lies far in the future. Utilization is not likely to lack adequate attention; the movement already started will gain momentum, and no forester will fail to turn it to the advantage of the community or interest that he represents. I urge only that what may be, rather than what is, have chief consideration. Manufacturers and consumers have had little encouragement to think of the inherent qualities of woods; fitness, not availability, is the true criterion. Taxation, which a few years ago loomed so large in the program

of most foresters, seems to be finding something like its natural place. It is a hopeful sign that this most complex question is being given over to the economists; that foresters and forest owners are less disposed to demand favors, but are satisfied to make their pleas on the ground of equity. In the discovery that few forests are actually taxed beyond their value, the chief argument for special consideration has been lost. Personally I have no belief that any effort which aims to set forests apart from all other classes of property in the tax list can succeed. Some assurance of stability in the levy that will enable an owner to forecast his obligation may be sought, but anything beyond this is sure to entail difficulties in administration, and particularly to arouse powerful antagonisms that cannot be overcome. Faulty, iniquitous if you like, as the general property tax is, it will not be bettered by making a set of exceptions. We can and should advocate and work for a revision of the tax laws, but it must be a general revision for the general good, not seeking my or your special advantage.

At this point may I express my belief—and it may be taken as the keynote of all that I have said—that we shall not be less worthy, not less successful foresters, if we are also clear-headed citizens. In the heat of enthusiasm and under the inspiration of a popular and ennobling effort, it is easy to become the special advocate. I would have this lessened a little, and our activities adjusted to the common interests of the community. In the extreme East, at least, we can assume that forestry has come to stay, and that the chief task now is to seize every opportunity and with infinite patience make every motion commend itself to the public that we serve.

STATE FORESTRY IN THE MIDDLE WEST

BY FILIBERT ROTH, ANN ARBOR, MICHIGAN

Director, Department of Forestry, University of Michigan

Since it is well and generally known that we in Michigan have no state forestry as yet, and that Wisconsin and Minnesota have at least a fair beginning, this talk on state forestry should be made by Cox or Griffith. In fact, it would seem almost like a joke to compel me to confess that eleven years of effort on my part have produced absolutely no results in this direction. And since I am always willing to obey orders, the confession is made, and I admit that we have worked for eleven years, and even longer, and nothing tangible or visible is as yet in existence which, even by a goodly stretch of the imagination, would deserve being called state forestry.

Nor does it seem that there is anything of real interest to the forester in the efforts, this history of trials and failures, for it never reached a point where forestry actually entered into the situation. Nevertheless there are a few facts that may be of interest in showing the opportunities for state forestry and the attitude of the people toward this development.

As early as 1870 the southern half of Michigan was well settled. In 1875 fully one fourth of the land area was "in soak" for taxes, and the amount of tax land from that time to 1903 never fell below six million acres, or one sixth of the land area of the State. In 1881 a regular bargain-counter sale netted for part of the lands sold only one cent per forty-acre description. Here certainly seemed an opportunity for state forests. And it did not lack for reminders. The fires of 1871, 1881, 1894, and many others sounded abundant warnings.

But there was no appreciation, and for that matter there is but little even to this day. In fact, there never was a governor who cared to make a message on forestry, nor a legislature in which there was even a half-dozen men who understood or cared about state forestry.

How much state forestry could have done here, how easily it could have been made self-supporting and more, every one here understands.

In 1903 the first forest reserves were created, a bagatelle of about 50,000 acres of poor, cut-over sand plains with a few swamps. The same year a special Forest Fire Warden was created, at the magnificent salary of five hundred dollars. In 1908 a Commission of Inquiry reported to the Legislature that the selling of lands at the usual price of about one dollar per acre meant a loss of about ten dollars per acre, by actual careful test. But this fell on deaf ears. Between 1901 and 1910 the State sold over one and one half million acres at about two million dollars. During the same time there reverted to the State, and were actually deeded to the State, 1,682,000 acres for non-payment of taxes.

On the report of the Commission of Inquiry the Legislature created the Public Domain Commission, with ample powers over all state lands, and obliged this commission to keep at least 200,000 acres as state forest. But the commission kept right on selling.

To-day the State has about 600,000 acres of land, claimed by about 230,000 acres of forest reserves in scattered parcels and with only about 50,000 of these with any kind of administration. The great opportunity is gone, and the whole affair looks blue. And yet this is all more seeming than real; and here lies a lesson. Looking wistfully at Wisconsin's success, we often chafed. But comparing the situation in both States we have about this: neither has real state forestry, neither has forest fire protection that really protects when the dry year comes. In Wisconsin they are fighting, and even good people up country are hot because they feel that something was rammed down their throats against their will. In Michigan our commission can set aside the whole 600,000 acres and do much more at any time it really wants to, and do it with little opposition. We talked and lost the land, they have the land and seemingly did business. Our talking has put our people in a favorable frame of mind, and if our Legislature wants to go ahead it will find the people prepared and ready to support it. In Wisconsin the people are fighting, the Legislature is fighting, and whether the lands stay put is to-day an uncertain question.

State forestry is our only important question in forestry in Michigan, and state forestry we shall have. But we do not want it until the people want it, and, better still, until the people know enough about this matter to know fully that they want and need it.

ADDRESS TO THE SOCIETY OF AMERICAN FORESTERS

BY B. E. FERNOW, TORONTO, CANADA

President, Society of American Foresters

At the outset I may be permitted to express to you the great gratification I feel at my elevation to what I consider the highest professional honor on this continent—the presidency of this society.

The gratification was the greater because, living out of the country, I could hardly expect to have this honor conferred on me. Confidentially, I may also say that when to my surprise I found my name on the nomination sheet I immediately asked for its withdrawal, for the reason that I felt little faith in my ability to serve you acceptably because of my lack of familiarity with the membership. I take it that the main function of the president of such a society as this, besides suggesting activities, is to select the men on the committees who are to carry on these activities, and for that purpose he should have intimate acquaintance with the membership in order to be able to appoint the fittest. As it is, I can hope to justify your confidence only if every member, and especially those of the executive committee elected by the membership, will direct me in this matter.

I may also—I hope without impropriety and certainly without animus—attach a special significance to my election, namely, the desire to free the society from the strong influence of officialdom which had quite naturally grown up. At least this desire has been expressed to me, after my election, by various members. I say this influence was quite natural and justifiable, for not only did the largest proportion of the membership at first belong to the official family of the Forest Service, but the leading men of the profession were also naturally found there; hence all presidents, and nearly all leadership so far, had come from the Forest Service.

While I do not know of anything untoward that has resulted from this practice, a change seems to have been found desirable, especially as now half, or more than half, of the membership comes from outside the Forest Service. It will interest those who have not given any attention to our growth that 56 per cent of the whole membership of 287 are outside the Forest Service, and of the active membership 49 per cent. Of these 49 per cent, 34 per cent (40 in number) are in state services, and exactly the same number are in academic life, the remainder being in private employ. I feel, therefore, that I am called to the position as a representative of the academic membership, and hence in my recommendations for activities of the society I may largely emphasize the academic interests.

I should also refer to the significant fact that not only is this the first meeting of the society outside of Washington, but also it is held on the occasion of an academic development in a place that knew me once as the academic head of the first forest school of this continent. This coincidence is, at least to me personally, of significance, and is fraught with some satisfaction.

At my time of life, the tendency is to be reminiscent rather than prophetic, to dwell in the past rather than make plans for the future, but Mr. Mulford is responsible for the program and for the theme of my address. Like a good forester, he recognizes that forestry is "planning and making provision for the future," and he has therefore set me to making plans for the society. With full

conception of modern practice, he does not call for a plan for a whole rotation, but only for the next decade, and I may perhaps still further limit the plan to an annual one—the length of a presidential year.

In order to make a plan one must know the object of the management, and so I may first be allowed to enlarge on what I conceive the object and function of this society to be—a subject which has, as far as I know, not been discussed before you, but which in general terms is well set forth in the first article of our constitution. The primary object, aim, or function of any grouping of professional men into a society may be formulated as the lifting of the profession out of unorganized, individual effort into an organized plane of associated effort, amalgamating the most worthy members of the profession into a representative body, in which, by personal contact and friendship, by interchange of thought, by inspiration of example, the interests of the individual are advanced, and at the same time the interests of the profession as a whole are guarded and advanced and given solidarity.

In the first place, then, by membership in the society there should be created a fellow feeling, there should be developed and fostered a freemasonry, as it were, which comes from closer acquaintanceship. The mere social features of meetings that have in view the cultivation of this better acquaintance among the members, the mere matter of getting together, should therefore by no means be underrated—indeed they should be considered of as much importance as any other feature of the meetings and of the society's *raison d'être*.

The wisdom that is brought into the meetings can, for the most part, be secured from the printed page; but the spirit and inspiration that come from personal contact and intimate intercourse can be secured only in the meeting of fellow workers. Knowledge of personalities, which is gained in these meetings, will reduce jealousy and rivalry, which are the bane of the early development of a new profession; it will promote tolerance, and finally secure mutual respect and a professional brotherhood, which could never be attained by those who work in individual solitariness.

Unfortunately our membership is still small and scattered over a vast area, and it is difficult to secure even for one annual meeting a considerable attendance. While the regular weekly meetings at Washington are an excellent thing, they can hardly be considered meetings of the society, for I dare say only rarely do members from outside the Washington contingent find their way to these meetings; they can and should be considered only group meetings. Altogether, it appears to me desirable, in order to secure the closer contact which comes from frequent meetings, that the idea of forming local branches or sections, or of dividing the membership into local units, should be more fully developed. In doing this, it is very necessary to see to it that the division into groups does not interfere with the character of the society at large as a truly national body. It is essential that the chapters or sections form a closely organized part of the whole, and that they remain subordinated to the present society, and that a proper influence and solidarity of the society be safeguarded.

I am aware that such sections are already in existence, and that we have provision for them in the constitution; but I am not sure that their relation to the parent society is such as the interests of the latter demand, that there is close enough touch and control, and a clear distinction, between the interests of the

society and those of the branches. The branches should never lose sight of the fact that they are integral parts of, and especially that they should become feeders to, the parent society. At the same time there should be a certain independence of the branch to permit its freer development.

In order to promote this relation, particularly one point in the article of the constitution with reference to sections could, in my opinion, be wisely changed. The clause reads: "Only active members of the Society should be eligible to membership in a section." This is a limitation which, I think, is not in the best interest of the profession or the society, if my idea of the branches acting as feeders is accepted. As the profession is growing, there will probably develop a class of junior members who might pass through a probationary period in the local branches, where they could show their worth before acceptance into the active membership of the society. Moreover, the admission of interested outsiders to membership in the branch could be made useful in broadening their interest and increasing the influence of our work. The sections, then, should have a wider membership than the society, made up of interested persons. This is a matter which the Executive Committee might well take under advisement, with a view to changing the constitution.

The next, and perhaps, the most important, use and function of the society is to set up standards; not only standards of technical usage, but also standards of professional ethics—moral standards, that is, principles of equitable conduct for its members, with regard to the special and specific problems that arise in our particular profession. The society is to be the standard bearer of professional honor.

We are treading here on delicate ground, nevertheless we are bound to enter it fearlessly and directly.

Now, more than ever, moral qualities, zeal, devotion to duty, fidelity, reliance, loyalty, need to be accentuated as the basis of efficiency more than the requirement of intelligence and knowledge. This is especially true in the field of labor, but is also true in the professional field. I heard only the other day of a large manufacturing concern which, in order to secure the work of 24,000 men, had last year not less than 42,000 names on its pay rolls—a lamentable exhibition of the lack of qualities that make for efficiency. Loyalty to the interest of employers rightly commands now the highest price. Those who think more of their duties than of their rewards and supposed rights find the most recognition.

While professional conduct should, of course, like all intercourse between men, be regulated by the golden rule and the decalogue, there arise concrete conditions and situations, perplexing cases specifically when proper conduct is in doubt. When the formulas prove difficult of application or easy of evasion, I may only refer to the common problems in ethics as to what constitutes a lie and whether a lie is justifiable.

In other older professions, gradually an unwritten code of ethics has grown up; in some, the representative societies have formulated a written code—as, for instance, those of the American Medical Association, the Boston Society of Architects, the Canadian Society of Civil Engineers; or at least efforts have been made to codify standards of conduct.* And it behooves us similarly to approach the

*A very useful briefed compilation of what has been done in this direction is to be found in the Transactions of the American Institute of Electrical Engineers for 1906.

subject deliberately, for, as our profession grows, such perplexing questions of conduct will arise more frequently, and the relations of forestry expert to client, to public, and to colleagues, or to other members of the profession,* will more frequently need adjustment.

The problem is, how this obligation is best met by the society.

Believing, as I do, that an honest interpretation of the spirit of the golden rule and the decalogue is, in most cases, sufficient to keep a man on the straight path, and that as a matter of fact most men try to do right and fail chiefly in their decisions as to what is right only in the more delicate cases and through inexperience, I shall not advocate the formulation of a written code of ethics for us. I agree, at least in part, with the Medical Society of the State of New York, which voted to abandon its formulated code of ethics at the suggestion of its president, who argued in these words: "It would mean more to the character of the medical profession and would enhance the respect in which it is held by the general public if the specific rules of ethical conduct were obliterated from the By-Laws of the State Medical Society, and if the regulation of such matters were hereafter left to the judgment of individual practitioners influenced by professional opinion and by local custom."

Yet, with our profession just starting on its career, "professional opinion and local custom" are hardly yet crystallized and the specific cases in which doubt as to proper behavior may arise are hardly known.

While conception of general morals will, of course, give the general direction, all generalization in ethics, as elsewhere, can at best be only an average, and therefore never *quite* true, even for a single instance. Such an average will have as many exceptions as inclusions, and *prima facie* no one can tell which is exception, which inclusion; in other words, no two cases are alike. Hence, conduct cannot be so fixed as to exclude thought and judgment, besides reliance on a well-cultivated conscience, to direct its variations. Right and wrong, honorable and dishonorable, are, after all, relative terms, which can only be fixed with reference to contingent circumstances.

There are certain broad principles, to be sure, which never change, which in all ages and in all walks of life have governed the most enlightened and honorable men—the outflow of our moral sense, which warns us, "Do nothing that you cannot tell"; but there are conflicts of principles in given cases when the choice requires delicate judgment.

Just to make clear the character of such cases, I may cite a number of examples that have arisen in other professions and may arise in modified form with us. On some of these, authorities of high standing differ:

May an expert use the information he obtains in the employ of a client, and how far, to his own advantage or to that of another? How far must he observe secrecy? How far is he in fiduciary position?

May an expert receive a commission from a manufacturer, or be in any way affiliated with him, whose machinery he recommends to a client? May he receive any compensation, "rake-off," or rebate except from his client?

May a professional man invest in a concern for which he reports? May he accept a contingent fee for his work, based on the success of the deal?

May he invest in something that he knows or expects his client is bound to require in carrying on his business?

May an employee secure patents on what he has developed in the business and works of his employer?

As a witness may he suppress information or opinion hurtful to the case of his client? May he act as a witness unless he is thoroughly convinced of the justice and truth of the case?

May he undertake work that he is not specially fitted for, and play himself off as an expert where he is not, giving advice which he knows in his mind is of doubtful value?

May he endorse undertakings on which he is not fully informed, and allow his name to be used for advertising purposes?

What are proper charges for different kinds of work?

While these questions refer to the relation of the professional man and his client, solicitude for himself and his fellows and their society also raises similar questions:

How far is a member of the profession and of a society justified in withholding his active interest in both? How far is he under obligation by contribution to its proceedings to make it a success, to support and encourage it, and to contribute to its dignity; in other words, does he owe an obligation akin to patriotism to his profession and his society?

Is it a justifiable interest that your profession be made important and its position before the world as commanding as possible, and what methods to that end are justifiable?

How far is professional and other criticism of one member by another justified? When is it desirable to suppress it? In what animus and form may it be delivered? What, in general, does professional courtesy mean and require?

How far may one use the work of others without giving credit?

What shall we think about underbidding and overbidding in order to secure work or to secure employees?

What does loyalty of assistants to superior officers require?

What, indeed, are proper relations in official life?

Where do the proprieties of competition begin and cease?

What are the proprieties in using professional title and professional advertising?

As I stated at the outset of this discussion, I would not advocate the formulation of a rigid and binding code of professional ethics which the society would enforce, yet I would make the society a forum before which such questions of ethics may from time to time be brought and discussed. I would go one step farther and suggest a standing honor committee, whose business it would be to bring such matters to discussion; and, more than that, a committee to whom members may refer delicate problems for expression of opinion which might help those who cannot unaided come to right decisions. Such a committee should be composed of older, experienced members, to whom younger members can look with confidence for right guidance on holding their professional honor above suspicion.

The mere existence of such a committee would exercise a wholesome influence in checking unprofessional conduct, and prevent many from falling into temptations; and gradually it might collect the cases on which it has delivered opinions, and at least a suggestive code might be the result. We have, so far, only provi-

sions of a punitive character in the constitution, namely, the committee investigating charges after the fact; but nothing of a promotive character.

From standardizing of moral and professional conduct we come to standardizing of professional and technical work as a proper function of the society.

I have had the pleasure, as my first action in the presidential chair, to appoint a committee to revise our terminology.

This is not an easy task, if the results are to be such as to secure general acceptance. I believe it was a committee of the society which a few years ago first attempted a terminology, but further experience has proved the attempt laid down in Bulletin 61 of the Forest Service inadequate. Since then experience has grown and the needs of a wider terminology have also grown. This is a matter that falls properly into the hands of the teachers, and hence in the selection for the committee I have largely drawn on the academic membership. Not only intimate knowledge of the subject to which the terms refer, but, also, when we have to coin new words, a linguistic sense, is needful in order to select the most adequate terms.

Like all language, the use of terms is partly dictated by personal taste; and here, as in literature and in ethics, following the example of good authority should be the best way of developing good taste.

It is not sufficient to have furnished the terminology, but it is necessary also to secure its acceptance, and here only the good will of the members of the society to comply can secure results. It is difficult and, indeed, annoying to have to abandon a term one has been in the habit of using, yet for uniformity's sake sacrifices must be made. In order to insure eventually a wider acceptance of the findings of the committee, I have taken the liberty of adding, as assessors, members of the Canadian Society of Forest Engineers, of which I happen to be also the president.

We hope that within the year a new terminology will be before the membership for discussion and acceptance.

Terminology is a growth; there are always new terms needed, and in order to avoid frequent revisions I would suggest a standing committee on terminology, to which terms might be submitted for sanction or which might suggest new terms as needed.

A number of usages in literary direction, besides the use of terms, need standardization. I may mention only the decapitalization of species names, and the capitalization of everything that pertains to forestry.

It is desirable that uniformity be secured in these directions, and the committee on terminology may very well add the revision of literary usage to its function.

Other directions in which standardization would be useful are in the making of growth tables, in mapping, in forest description, and the like.

Of course such standardization may, with propriety, be established by the Forest Service, which needs them in its practical work; yet it would be useful if the broader interests of the society had a hand in them. I believe the Forest Service could only be the gainer by referring some of the problems to the society, and that without losing any of its prestige.

Believing that the standardizing of the terminology will be a sufficient problem for the present year, I shall not expand on other lines of standardization.

Next to the setting up of standards, professional development in all directions, interest and advancement in its science and in its practice, is to be stimulated by contributions of members to the literature, presented in papers at the meetings or in articles for publication.

Every professional man who is a member of a society has, in my opinion, a moral obligation to add to the store of professional knowledge, to make public and available to his colleagues new data and experience. This does not mean that he should rush into print without proper basis, but he should not withhold what information he can impart that would advance the profession. Sins of omission in this respect are much more frequent than sins of commission. From the individual efforts in this respect there comes the associated effort, in which problems of a more complicated nature are involved. Here teamwork, committee work of an investigatory character, is called for, and a broad field of useful work in advancing professional or technical knowledge is opened up. Organized experimental work of a comparative character, in which a number of members can give their end, should eventually be formulated.

This brings me to the question of the method of publication. Hitherto we have had two publications for our technical literature: the Proceedings of the Society, and the Forestry Quarterly, now published by the American Forestry Association. I think there should still be two publications, perhaps with more differentiation in the character of the material printed. The Proceedings should be reserved for the publication of weightier articles and more complete pieces of work, while the more ephemeral discussions should go to the Quarterly.

I believe the time has arrived when the Quarterly should become a monthly. There is now enough material coming forward to make this possible, and a livelier interest would be secured by the more rapid and frequent publication. The only problem is the financial one. While a quarterly publication may, as the Forestry Quarterly does, rely entirely on gratuitous editorial work, a monthly publication would require the services of a paid editor, or at least assistant editor.

It is not essential, and it is not suggested, that the society as such should undertake the financial burden of such a publication, but its members should at least loyally support the publication both by subscribing and by contributions of material. The Board of Editors now numbers several very active contributors, who deserve the thanks of the profession for their freely given services; and I have no doubt that if the change to a monthly takes place, they will still be willing to continue to serve. Negotiations are under way with the American Forestry Association, with a view to such a change.

Besides the technical advancement of the profession, the society has a call to make its influence felt in educating the public.

A very dangerous method has been proposed for doing so, namely, to formulate opinions and promulgate them as the official opinions of the society for public acceptance. I last year expressed myself adversely to this proposition, and I could not bring stronger arguments against it than are contained in my letter, which the Executive Committee has seen proper to print in its report. I consider the proposition thoroughly untenable. Expression of opinion, especially on scientific questions, can only be individual and personal, and the value of the opinion can only be in proportion to the opportunity that the individual has had for coming to a conclusion.

I believe that in this respect—namely, education of the public—sections in their meetings, but especially individual effort, can be most effective. Each member of the society should feel the obligation that is incumbent on him to have the public properly instructed and guided on all matters in which such instruction can be beneficial to the interests of the profession. Here the use of the public press, general and special, suggests itself, as well as readiness in personal intercourse and in lecture halls to make the public wiser. For a time, still, every technically educated forester should be a propagandist. To eradicate foolish and misleading notions, to make clear the object and methods of forestry, to show its relation to public welfare, to explain the apparent antagonism of lumberman and forester, and especially to explain to the lumberman himself the usefulness of the forester—such themes each forester should know how to discuss convincingly, in order to bring his occupation into proper repute. He who does not attempt this when opportunity offers is simply shirking his duty.

The sequel to this attitude—and one in which associated effort, an expression of the society as a whole, is justifiable—consists in bringing the influence of the society to bear on preventing or promoting legislation inimical or favorable to the legitimate interests of the profession, and developing proper policies. This is best done, as is all society work, by a committee, either a special legislative committee or the Executive Committee.

At the present time our membership has not yet reached the three hundred mark, but it is to be anticipated that the rapid increment stage will be at hand within the next decade. Then it will perhaps become apparent that the profession is overstocked; or at least that difficulties may arise in finding employment for all, even for all deserving ones. When that time arrives, it may be found that the society could fulfill a useful function in acting as an employment bureau. I believe that even now there are more would-be employers than are known, who would employ men or seek advice if they knew where to find them. Perhaps even now effort in bringing employer and employee together may be justified.

The danger of overcrowding the profession, which, I consider, is at our door, should form a matter of solicitude for the society, especially if the idea of acting as an employment bureau should be accepted. The Secretary, who would probably act in that capacity, should canvass the situation and publish his findings from time to time.

Sooner or later, a paid secretary will be a *conditio sine qua non*. I believe the most important advance of the society's interests during the next decade will be had, when an active, paid secretary can devote all his time to the work. There is no reason why our society should not grow at the same pace as, for instance, the American Institute of Mining Engineers. In 1872 that profession was somewhat in the same condition as we were, say, in 1900, when our society was organized. Mining engineers were as little recognized as foresters. I became a Life Associate of the Institute six years after its foundation, and I remember it was then a lively infant, and it has grown lustily and steadily, all because of having an attentive nurse in its Secretary, until now it numbers over four thousand. When that condition is attained, that the society can afford a paid secretary, and when the finances generally of the society are improved, many more useful activities could be suggested. And all these activities would

make it much more worth while to be a member of the society, so that it would be proper to suggest that the membership fee be again raised to its original amount, or even increased, in order to secure these benefits.

And now, while I feel that I have hardly furnished a formulated working plan, I hope I have opened up a sufficient number of directions in which the managers of the future will be able to advance.

While we are still as we are, professionally in the pioneering stage, it is of little use to predict and prescribe even for a decade; the direction in which to proceed is all that can be pointed out. And as in the practical field to-day, to my mind, silviculture should be the important aim and working plans only a secondary consideration so long as a manager with judgment is at the helm, so, I believe, increase in membership and finances should be the main aim of the society, when it will not be difficult from year to year to find managers to dispose of members on committee work and of funds to make their work tell. And I hope to be present at the end of the decade, and see the normal stock, normal increment, and normal age classes established.







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